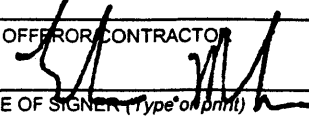
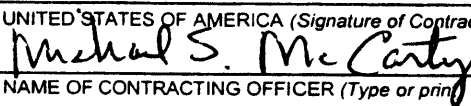


NASA Launch Services (NLS)
Falcon 1 and Falcon 9 Launch Vehicles
Solicitation No.: RFP10-99-0021REVB
Contract No.: NNK08LA91B

SECTION A
STANDARD FORM 1449

| | | | | | | | |
|--|--|---|--|---|--|--|--|
| SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24 & 30 | | | | 1. REQUISITION NUMBER | | PAGE 1 OF 1 | |
| TRACT NO. NNK08LA91B | | 3. AWARD/EFFECTIVE DATE | | 4. ORDER NUMBER | | 5. SOLICITATION NUMBER RFP10-99-0021 Rev C | |
| 6. SOLICITATION ISSUE DATE October 18, 1999 Updated 2/ 28/2008 | | 8. OFFER DUE DATE/LOCAL TIME As specified in the Commercial Item RFP Form | | 7. OFFER DUE DATE/LOCAL TIME | | | |
| 8. OFFER DUE DATE/LOCAL TIME | | a. NAME Jacqueline Brooks | | b. TELEPHONE NUMBER (No collect calls) 321-867-7698 | | | |
| 9. SOLICITATION INFORMATION CALL: | | | | | | | |
| ORDERED BY NASA John F. Kennedy Space Center Procurement Office, Mail Code: OP-LS Attn: Jacqueline Brooks, Room 2015 Kennedy Space Center, Florida 32899 | | | | 10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED SET ASIDE: % FOR SMALL BUSINESS SMALL DISADVANTAGED BUSINESS 8(A) SIC: 3761 SIZE STANDARD: 1000 | | 11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE 12. OFFER ACCEPTANCE PERIOD 180 Days from Date in Block 8 <input checked="" type="checkbox"/> 13A. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) 13B. RATING DO-C9 | |
| METHOD OF SOLICITATION <input type="checkbox"/> RFQ <input type="checkbox"/> IFB <input checked="" type="checkbox"/> RFP <input type="checkbox"/> RFO | | | | 16. ADMINISTERED BY Same as Block 9. | | | |
| DELIVER TO Same as Block 9. | | | | CODE OP-LS | | | |
| CONTRACTOR/ OFFEROR Space Exploration Technologies 1 Rocket Road Hawthorne California 90250 PHONE NO. (310) 363-6229 | | | | FACILITY CODE 3VBL8 18a. PAYMENT WILL BE MADE BY JOHN F. KENNEDY SPACE CENTER GG-B-B1 KENNEDY SPACE CENTER, FLORIDA 32899 | | | |
| CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER | | | | 18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED SEE ADDENDUM | | | |
| 20. SCHEDULE OF SUPPLIES/SERVICES NASA LAUNCH SERVICES IN ACCORDANCE WITH SECTION B, C AND D. (Attach Additional Sheets as Necessary) | | | | 21. QUANTITY 22. UNIT 23. UNIT PRICE 24. AMOUNT | | | |
| COUNTING AND APPROPRIATION DATA | | | | 26. TOTAL AWARD AMOUNT (For Govt. Use Only) See Section B, Clause 2.0 | | | |
| SOLICITATION INCORPORATES IN FULL TEXT FAR 52.212-1, 52.212-4, FAR 52.212-3 & 52.212-5 ARE ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED. | | | | CONTRACT/PURCHASE ORDER INCORPORATES IN FULL TEXT FAR 52.212-4, FAR 52.212-5 IS ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED. | | | |
| CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 3 TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED | | | | 29. AWARD OF CONTRACT: REFERENCE OFFER DATED THE OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS: | | | |
| SIGNATURE OF OFFEROR/CONTRACTOR  | | | | 31a. UNITED STATES OF AMERICA (Signature of Contracting Officer)  | | | |
| NAME AND TITLE OF SIGNER (Type or print) Elon Musk, Chief Executive Officer | | | | 30c. DATE SIGNED 3/5/2008 | | 31b. NAME OF CONTRACTING OFFICER (Type or print) Michael S. McCarty | |
| 31c. DATE SIGNED 4-22-08 | | | | | | | |
| QUANTITY IN COLUMN 21 HAS BEEN <input type="checkbox"/> RECEIVED <input type="checkbox"/> INSPECTED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED | | | | 33. SHIP NUMBER <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL | | 34. VOUCHER NUMBER 35. AMOUNT VERIFIED CORRECT FOR | |
| SIGNATURE OF AUTHORIZED GOVT. REPRESENTATIVE | | | | 36. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL | | 37. CHECK NUMBER | |
| 32c. DATE | | | | 38. S/R ACCOUNT NO. | | 39. S/R VOUCHER NO. | |
| 40. PAID BY | | | | 42a. RECEIVED BY (Print) | | 42b. RECEIVED AT (Location) | |
| CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT | | | | 42c. DATE REC'D (YY/MM/DD) | | 42d. TOT. CONTAINERS | |
| SIGNATURE AND TITLE OF CERTIFYING OFFICER | | | | 41c. DATE | | | |

REPRODUCED FOR LOCAL REPRODUCTION

STANDARD FORM 1449 (10-95)
Prescribed by GSA - FAR (48 CFR) 53.212

Section B

SECTION B

STANDARD FORM 1449 CONTINUATION

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SECTION B**STANDARD FORM 1449 CONTINUATION****1.0 SCHEDULE OF SUPPLIES AND/OR SERVICES TO BE PROVIDED**

The Contractor shall provide all services, facilities, and resources (except as may be expressly stated in this contract as furnished by the Government) necessary to furnish the Contract Line Item Number (CLIN) items (Tables B-4 through B-12) in accordance with the Statement of Work (SOW), Exhibits, and Documents attached hereto.

1.1 Reserved**Table B-1:** Reserved**1.2 Reserved****Table B-2:** Reserved**1.3 Reserved****Table B-3:** Reserved**1.4 Non-Standard Services Ordered Independently of a Defined Mission**

The Government reserves the right to order non-standard services independently of Launch Service Task Order (LSTO) missions under this CLIN from the items listed in Table B-12. The Contracting Officer may order the services at any time by written notice to the Contractor from the effective date of the contract through calendar year 2010.

| CLIN | Description of Supplies and Service | Qty | Unit | Unit Price (\$) | Total Amount (\$) |
|------|--|-----|---------|-----------------|-------------------|
| 9 | Non-Standard Services Ordered Independently of a Defined Mission | A/R | Service | See Table B-12 | See Table B-12 |

Table B-4: Non-Standard Services Ordered Independently of a Defined Mission

1.5 Special Task Assignments (Studies and Analyses)

| CLIN | Description of Supplies and Service | Qty* | Unit | Unit Price (\$) | Total Amount (\$) |
|------|---|------|------------|------------------|-------------------|
| 10 | Special Task Assignments – Firm Fixed-Price Composite Labor Hours | A/R | Labor Hour | See Tables B-6/7 | See Tables B-6/7 |

* Not to exceed 500,000 Cumulative Hours for Calendar Years 2006 through 2010

Table B-5: Special Task Assignments (Studies and Analyses)

Ex 4

Table B-6: Hourly Labor Rate - FFP List

The Contractor shall submit a price proposal update to convert NTE CY 2009 – 2010 labor rates into FFP labor rates at least 180 days prior to the end of CY 2008. The proposed labor rates shall be negotiated using the applicable procedures of FAR Part 15 and incorporated herein.

Ex 4

Table B-7: Hourly Labor Rate - NTE Price List

1.6 IDIQ Launch Service Task Order (LSTO)

The Government reserves the unilateral right to order launch services at any time from contract award through the second quarter of CY 2010 in accordance with contract Section C, Clause 14.0, Launch Service Task Ordering Procedures. These launch services are identified in Tables B-9 and B-10 and described in Exhibits 2 and 3 to the Statement of Work.

NTE prices for launch services for IDIQ missions will be part of the price evaluation and best value selection for award of an IDIQ task order contract.

IDIQ launch services for TBD missions represent potential requirements for launch services.

In no event shall the Government be obligated to pay for any launch service prior to Authority To Proceed and obligation of funds for that launch service. The minimum order quantity for NLS IDIQ contracts awarded in accordance with Section C, Clause 2.0, On-Ramp and Technology Insertion, is \$20,000.00. The maximum order quantity for this IDIQ contract portion is thirty (30) Launch Service Task Orders and associated non-standard services/mission unique services.

| CLIN | Description of Supplies and Services | Qty | Unit | Unit Price (\$) | Total Amount (\$) |
|---------|--|------------------|---------|-----------------|-------------------|
| 13 | IDIQ Launch Service Task Order (LSTO) | TBD ¹ | Service | TBD | TBD |
| SubCLIN | | | | | |
| 13A | Standard Launch Services and Standard Mission Integration in accordance with the SOW and Exhibit 2 | TBD ² | Lot | See Table B-9 | |
| 13B | Non-Standard Services in accordance with the SOW and Exhibit 3 | TBD | Lot | See Table B-10 | |
| 13C | Known Mission Unique Hardware and Software Non-recurring Items in accordance with SOW Exhibit 6 | TBD | Lot | TBD | |

¹ The actual number of LSTOs to be awarded is TBD.

² The actual number of missions to be included in each LSTO is TBD.

Table B-8: IDIQ Launch Service Task Order

1.7 NTE Prices - Standard Launch Services for IDIQ Missions

The Government shall have the right to order the standard launch services at the prices and for the launch vehicle configurations identified in Table B-9. Nothing in this clause precludes the Contractor from proposing more favorable prices or

discount terms in response to specific requests for launch service proposals in accordance with contract Section C, Clause 14.0.

The Offeror shall add as many rows (in Table B-9 format) necessary to identify all standard launch service NTE prices for each launch vehicle configuration proposed. The Offeror shall also propose a table(s) (Table B-9a) of quantity discounts that shall correspond and apply to the proposed NTE standard launch service prices in Table B-9 for each launch vehicle configuration. The proposed quantity discount shall apply in the event the Government orders more than one launch service in the same year and/or under an individual LSTO. The quantity discount may be in terms of a percentage or dollar amount reduction from the stated NTE price. The quantity discount may apply to the number of launch services generally or may be applied to the number of launch vehicle configurations specifically, or both.

Ex. 4

Table B-9: NTE Price List - Standard Launch Services for IDIQ Missions

Ex 4

Table B-9A: NTE Price List - Standard Launch Services for IDIQ Missions Discounts for launches purchased at one time

1.8 NTE Prices – Non-Standard Services for IDIQ Missions

The Government shall have the right to order the following non-standard services at the prices and for the launch vehicle configurations identified in Table B-10. Nothing in this clause precludes the Contractor from proposing more favorable

prices or discount terms in response to specific requests for launch service proposals in accordance with contract Section C, Clause 14.0.

Ex 4

|

|

Ex 4



Ex
4

Ex.
4

Table B-10: NTE Price List - Non-Standard Services for IDIQ Missions

2.0 TOTAL AWARD AMOUNT

The guaranteed minimum value of this contract is \$20,000.00. The total maximum value of this contract is **\$TBD**.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or

addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

The Offeror shall add as many rows (in Table B-11 format) necessary to identify all standard launch service firm fixed-prices for each launch vehicle configuration proposed. The Offeror shall submit an associated Table B-11 for standard launch service substitutions with the Launch Service Proposal (LSP), when applicable.

Not applicable at this time

| LAUNCH VEHICLE CONFIGURATION | FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED | | | | |
|------------------------------------|---|------|------|------|------|
| | 2006 | 2007 | 2008 | 2009 | 2010 |
| | | | | | |
| | | | | | |
| | | | | | |

Table B-11: FFP List for Standard Launch Services

3.3 Non-Standard Service Additions and Deletions

Prior to the "no-later-than ordering date," the Government has the unilateral right to add or delete the non-standard launch services identified in Table B-12, at the prices stated therein, for the non-standard launch services identified for the IDIQ missions awarded to the contractor (Table B-8). Any such addition / deletion accomplished prior to the "no-later-than ordering date" shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for additions / deletions

made after the "no later-than ordering date" shall be subject to the changes clause.

The Offeror shall add as many tables and additional rows (in Table B-12 format) necessary to identify all non-standard service fixed prices for each launch vehicle configuration proposed.

Not applicable at this time

| Launch Vehicle Configuration TBP From Table B-11 | | | | | |
|--|---|------|------|------|------|
| NON-STANDARD SERVICES PRICE LIST ITEM | FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED | | | | |
| | 2006 | 2007 | 2008 | 2009 | 2010 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Table B-12: FFP List for Non-Standard Services

4.0 MOST FAVORED CUSTOMER

The Contractor hereby certifies the CLIN prices for standard launch services (including standard mission integration) under this contract are no higher than the lowest price charged to any other commercial or U.S. Government customer for an equivalent launch service during the twelve (12) months both preceding and following contract award, or placement of a launch service task order. The Government shall be entitled to a one-time reduction in contract price for each standard launch service failing to meet this certification. The price credit will be equal to the difference between the standard launch service price under this contract and the lower price awarded for an equivalent launch service.

5.0 IDIQ LAUNCH SERVICE AND PRICE UPDATES

Successful Offerors who receive NLS IDIQ contract awards may propose additional IDIQ NTE launch services and prices via the on-ramp and technology insertion clause, Section C, Clause 2.0. IDIQ contract holders will not be entitled to unilaterally adjust NTE prices or delete launch services already in the contract. Contractor initiated changes to the launch vehicle configuration, vendor, or design shall be subject to the launch vehicle qualification requirements of Section

C, Clause 3.0. Contractor initiated changes to the launch vehicle configuration, vendor, or design, after mission ATP, shall be at no increase to the contract price and subject to the written approval of the Contracting Officer. New launch vehicle qualification plans and revisions to existing qualification plans may be proposed for inclusion into the contract when submitting Launch Service Proposals (LSPs) pursuant to Section C, Clause 14.0, and shall be subject to the written approval of the Contracting Officer.

Section C

SECTION C

CONTRACT TERMS AND CONDITIONS

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CONTRACT TERMS AND CONDITIONS

1.0 FAR 52.212-4 CONTRACT TERMS AND CONDITIONS--COMMERCIAL ITEMS (OCT 2003) (TAILORED)

- (a) *Inspection/Acceptance.* Pursuant to FAR Subpart 12.402(b), FAR clause 52.246-11 Higher-Level Contract Quality Requirement (Feb 1999) shall govern and apply to this contract and is provided in full text in Section C, Clause 16.0. For launch service Contract Line Item Numbers (CLINs) prior to launch, the provisions of FAR clause 52.246-4 Inspection of Services—Fixed-Price (Aug 1996) shall govern and apply to this contract and is incorporated by reference under contract Section C, Clause 35.0. The Government reserves the right to perform in-process inspection or testing of any supplies or launch services tendered for acceptance prior to launch.

The Government will accept only those launch services that successfully deliver a separated and undamaged payload to the proper orbit conditions and insertion accuracies and do not exceed the environmental parameters stated in the Interface Control Document (ICD) except as otherwise provided in this contract. Acceptance of launch service CLINs shall be in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. The Contractor shall only tender for acceptance those items conforming to the contract requirements. For launch services not conforming to the contract requirements, the sole remedy for partial mission success is the forfeiture of the final payment. The sole remedy for a failed mission is the forfeiture of the final payment and the return of 15% of the launch service price as determined by the provisions of contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. For supplies or services other than launch services, the Government will require repair or replacement of nonconforming supplies or re-performance of nonconforming services at no increase in contract price. For launch services, the Government must exercise its post-acceptance rights within the time specified in contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. For supplies or services other than launch services, the Government must exercise its post-acceptance rights --

- (1) Within a reasonable time after the defect was discovered or should have been discovered; and
 - (2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.
- (b) *Assignment.* The Contractor or its assignee's rights to be paid amounts due as a result of performance of this contract, may be assigned to a bank, trust

company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727).

- (c) *Changes.* FAR clause 52.243-1 Changes - Fixed-Price (Aug 1987) Alt I (Apr 1984) is hereby incorporated by reference under contract Section C, Clause 35.0. The time requirement for proposal submission is increased from thirty (30) days to (60) sixty days.
- (d) *Disputes.* This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes (Dec 1998), incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.
- (e) *Definitions.* The clause at FAR 52.202-1, Definitions (May 2001), is incorporated herein by reference under contract Section C, Clause 35.0.
- (f) *Excusable delays.* The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence. Excusable delays for launch delays by either party are identified and shall be resolved in accordance with contract Section C, Clause 19.0, Adjustments to Launch Schedule.
- (g) *Invoice.* The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized,) to the address designated in the contract to receive invoices. An invoice must include:
 - (1) Name and address of the Contractor
 - (2) Invoice date
 - (3) Contract number, contract line item number, and, if applicable, the order number

- (4) Description, quantity, unit of measure, unit price and extended price of the items delivered
 - (5) Shipping number and date of shipment including the bill of lading number and weight of shipment if shipped on Government bill of lading
 - (6) Terms of any prompt payment discount offered
 - (7) Name and address of official to whom payment is to be sent
 - (8) Name, title, and phone number of person to be notified in event of defective invoice. Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. Contractors are encouraged to assign an identification number to each invoice.
- (h) *Patent indemnity.* The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.
- (i) *Payment.* Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. If the Government makes payment by Electronic Funds Transfer (EFT), see 52.212-5(b) for the appropriate EFT clause. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.
- (j) *Risk of loss.* Risk of loss of or damage to Government property under this contract will be governed by FAR clause 52.246-25 Limitation of Liability--Services (Feb 1997) and is hereby incorporated by reference under contract Section C, Clause 35.0.
- (k) *Taxes.* The contract price includes all applicable federal, state, and local taxes and duties.
- (l) *Termination for the Government's convenience.* The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience subject to the terms of this contract specified in contract

Section C, Clause 28.0, Advance Understanding Regarding Termination
Settlement under FAR Clause 52.212-4(l).

- (m) *Termination for cause.* The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, including failure to meet launch dates or maintain qualified launch vehicles, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, including all launch service payments previously paid and all launch service payments remaining to be paid, the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.
- (n) *Title.* Unless otherwise specified in a Task Assignment, title to items furnished in conjunction with services under this contract shall remain with the Contractor. In accordance with 42 U.S.C. 2465d, NASA shall not take title to launch vehicles under contracts for launch services.
- (o) *Warranty.* Unless otherwise specified in a Task Assignment, the Contractor makes no warranty, express or implied, with respect to the services delivered or performed hereunder.
- (p) *Limitation of liability.* Except as provided for in paragraphs (a) and (j) above, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.
- (q) *Other compliances.* The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.
- (r) *Compliance with laws unique to Government contracts.* The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. 327, *et seq.*, Contract Work Hours and Safety Standards Act; 41 U.S.C. 51-58, Anti-Kickback Act of 1986; 41 U.S.C. 265 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. 423 relating to procurement integrity.

- (s) *Order of precedence.* Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order:
- (1) The schedule and description of supplies/services (Section B, C, and Statement of Work, excluding contract clauses incorporated by reference).
 - (2) The Assignments, Disputes, Payments, Invoice, Other Compliances, and Compliance with Laws Unique to Government Contracts paragraphs of this clause.
 - (3) The clause at FAR 52.212-5 (Section C, Clause 34.0).
 - (4) Addenda to this solicitation or contract, including any license agreements for computer software.
 - (5) Solicitation provisions if this is a solicitation.
 - (6) Other paragraphs of this clause.
 - (7) The Standard Form 1449.
 - (8) Contract clauses incorporated by reference.
 - (9) Other documents, exhibits, and attachments.
 - (10) The specification.

2.0 ON-RAMP AND TECHNOLOGY INSERTION

- 2.1 The purpose of the IDIQ on-ramp is to create an opportunity for new, emerging launch service providers and for incumbent launch service providers to introduce qualified launch vehicles not available at the time of the award of the initial contract and to compete for additional requirements not identified as firm or option requirements under the basic contract. The intent of the on-ramp is to foster competition for future requirements for launch services.
- 2.2 The parties mutually agree that the original solicitation, as revised, shall remain open during the life of this contract and that at any time subsequent to the award of the present contract, the Government may award additional contracts for IDIQ requirements. Each February and August during the life of this contract, or at any other time established via synopsis, the Government, will accept proposals from new launch service providers for IDIQ contracts and proposals from existing IDIQ contractors for additional launch services. If the Government issues a

solicitation notice, new launch service providers and current IDIQ contractors will be allowed to submit proposals, within the notice's stated response time. The minimum contract requirements (as revised), the technical acceptability standards, evaluation factors, solicitation terms and conditions, price reasonableness, and basis for award shall remain in full force and effect for each new proposal. Upon award of each additional contract, the Government shall notify all present Contractors of the award, and the new Contractor shall thenceforth be eligible to compete with all present Contractors for the award of IDIQ task orders.

2.3 Expansion of Performance Capabilities

NASA reserves the right to consider, in the future, expansion of the performance capabilities covered by the IDIQ portion of the NLS contract, by properly soliciting offers from all interested sources capable of meeting the requirements in the expanded performance capabilities.

2.4 Technology Insertion – Additional Launch Services Not Previously Proposed

Existing Contractors may submit proposals each February and August subsequent to award to update launch service prices and/or introduce new launch service capabilities, improvements, and technology upgrades. The Contractor may propose new or modified launch services consistent with the terms and conditions of this contract. New or modified vehicles will be qualified based on the requirements established by NPD 8610.7, ELV Risk Mitigation Policy for NASA-Owned and NASA-Sponsored Payloads and contract Section C, Clause 3.0, Launch Vehicle Qualification. Launch services must comply with all the conditions and requirements of the SOW.

2.5 The minimum order quantity for IDIQ contracts awarded in accordance with this On-Ramp Clause is \$20,000.00.

3.0 LAUNCH VEHICLE QUALIFICATION Note: Where the term "qualification" is used when referring to Category 2 and 3 launch services, the term "qualification" or "qualified" is intended to be synonymous with the term "certification" or "certified".

3.1 Any launch vehicle configuration utilized by the Contractor to provide launch services under this contract must be qualified by NASA in accordance with NPD 8610.7, ELV Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads. Launch vehicle configuration qualification will be performed in accordance with Program Management Instruction (PMI) K-ELV-10.2 Rev B, Launch Vehicle Certification.

3.2 Qualification Criteria:

- (A) The Launch Service Provider (LSP) shall be a domestic LSP pursuant to Section 201 of Public Law 105-303, Commercial Space Act of 1998.
- (B) The LSP must obtain an ISO 9001/2000 third party certification, from a registrar accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB), for any corporation, corporate divisions, subsidiaries, joint ventures, partner(s) and/or any other business entity actually performing launch vehicle manufacturing, management, payload/launch vehicle integration, testing and launch.
- (C) For contract award of IDIQ launch services, the launch vehicle configuration must be qualified to the required payload risk category or the Contractor must provide a viable plan, subject to Government assessment and acceptance, to achieve all qualification requirements prior to launch. If a qualification plan (Attachment D1, Exhibit 7) is submitted, it shall be exempt from disclosure as provided under the FOIA.
- (D) Services under this contract will only include launch vehicles qualified to risk mitigation Category 2 in accordance with NPD 8610.7. The Contractor shall submit required documentation for NASA evaluation and determination of qualification category. NASA shall not bear any cost associated with the development of any LSP documentation required for the qualification of a launch vehicle configuration.
- (E) For Category 2 and 3 missions, the proposed launch vehicle configuration shall achieve one successful launch prior to formal notification of mission Authority to Proceed (ATP).
- (F) Prior to launch of the NASA payload, the proposed launch vehicle configuration shall be qualified to the required payload risk category.
- (G) NASA reserves the right to require that selected Category 3 payloads be launched only on launch vehicle configurations that have fourteen consecutive, successful launches of the launch vehicle configuration.
- (H) A launch vehicle qualified to a higher category is inherently qualified to launch payloads designated as a lower category (i.e., launch vehicles qualified to launch category 3 payloads are also qualified to launch category 1 and 2 payloads).
- (I) If no qualified launch vehicle configurations exist to meet specific mission requirements solicited under a NASA request for contract proposal, the Launch Service Program Office (LSPO) may elect to award or issue ATP of a

mission contingent on the launch vehicle configuration achieving qualification requirements tailored by NASA.

- 3.3 For new vehicles and upgraded or modified vehicle configurations, NASA may require additional technical insight into the design, manufacturing, testing, integration, and first launch of the effected systems and launch vehicle.
- 3.4 In the event of a launch failure of a qualified common vehicle configuration, the LSPO may participate in or perform a failure investigation/return-to-flight board to re-qualify the launch vehicle configuration to a particular risk mitigation qualification category.

4.0 OFF-RAMP CLAUSE

- 4.1 The Government intends to award LSTO missions contingent upon one successful launch of the proposed vehicle prior to ATP and launch vehicle qualification prior to launch of the NASA mission.
- 4.2 ATP is formal written direction from the Contracting Officer that will typically occur at L-27 months before launch. Prior to ATP, the Government will perform an assessment of the Contractor's current plan to achieve launch vehicle qualification prior to launch of the NASA mission. In the event qualification does not occur prior to L-12 months, the Government will perform an additional assessment of the current qualification plan. If the Government determines the launch vehicle will not obtain qualification prior to launch of the NASA mission, the Government retains the right to invoke the remedies described in paragraphs 4.3 and 4.4 of this clause.
- 4.3 In the event the Government determines the launch vehicle will not be qualified by launch based on its L-12 month assessment, or the launch vehicle configuration loses qualification status after ATP, the Government may withhold payment, and/or delay the launch date and payment schedule until launch vehicle re-qualification at no increase in price, or terminate the launch service for cause pursuant to contract Section C, Clause 1.0(m) Termination for cause. In the event the Government delays the launch date and payment schedule, the Contractor shall be liable for liquidated damages for the length of delay as established by contract Section C, Clause 19.0, Adjustments to Launch Schedule. This clause shall also apply to any launch service awarded via LSTOs in fulfillment of IDIQ contract requirements.
- 4.4 The Contracting Officer shall send a cure notice prior to terminating a contract for cause. The Government's rights after a termination for cause shall include all the remedies available to the Government under the Termination for Cause of FAR 52.212-4(m). The Government's preferred remedy will be to acquire similar items from another Contractor and to charge the defaulted Contractor with any excess re-procurement costs together with any incidental or consequential damages

incurred because of the termination. When a termination for cause is appropriate, the Contracting Officer shall send the Contractor a written notification regarding the termination. At a minimum, this notification shall:

- (A) Indicate the contract is terminated for cause
- (B) Specify the reasons for the termination
- (C) Indicate which remedies the Government intends to seek or provide a date by which the Government will inform the Contractor of the remedy
- (D) State that the notice constitutes a final decision of the Contracting Officer and that the Contractor has the right to appeal under the Disputes clause.

5.0 LAUNCH SERVICE PAYMENTS, MILESTONE EVENTS AND COMPLETION CRITERIA

- 5.1 The Contracting Officer will inform the Contractor of ATP with the launch service via written direction. ATP is independent of contract award, or launch service task order award. The Government is not obligated to pay the Contractor for any launch service activity prior to the Contracting Officer's written notification of ATP.
- 5.2 Upon successful completion of a milestone event and submission of a properly certified invoice, the Contractor may request commercial interim payments. The commercial interim payments will be paid in accordance with the payment schedule shown in Table C-1 and based on the milestone events identified in the contract Work Plan (Attachment D8).
- 5.3 Commercial interim payments are contract financing payments that are not payment for accepted items. Commercial interim payments are fully recoverable, in the same manner as progress payments, in the event of default. Commercial interim payments are contract financing payments and, therefore, are not subject to the interest-penalty provisions of prompt payment. However, these payments shall be made in accordance with the Agency's policy for prompt payment of contract financing payments. In accordance with 42 U.S.C. 2465d, NASA shall not take title to launch vehicles under contract for launch services.
- 5.4 In the event an LSTO is issued less than twenty-four months prior to launch, the initial payment for such launch service will be the cumulative total of all payments that would have been paid if the the LSTO had been issued at L-27 months. If a non-standard "call-up" service is ordered when an LSTO is issued, the initial payment shall include the catalog price adjustment. If no "call-up" service exists, the initial payment shall be subject to equitable adjustment.

- 5.5 Scheduled dates in Table C-1 are tentative and represent invoice submission dates. Payment schedules may be deferred or canceled by the Government if the Contractor fails to make substantial progress in accomplishing the major launch service milestone events in the attached contract Work Plan. Payments falling due in the first quarter of each fiscal year (October - December) shall be paid promptly to the maximum extent practicable, but shall not be considered late until January 31 of the following calendar year.
- 5.6 In the event launch service SubCLINs are terminated independently of standard launch service CLINs, the parties mutually agree the same termination refund schedule percentage(s) shall be used and applied against the price for the terminated SubCLIN. Table C-1 milestone events shall apply to each IDIQ LSTO issued under this contract.
- 5.7 This paragraph will apply to any postponement declared by the Government or the Contractor for any reason, including launch schedule adjustments and Contractor failure to make substantial progress in accordance with launch service milestone events (as determined by the Government under this clause). In the event of a launch schedule adjustment by the Government or Contractor in accordance with contract Section C, Clause 19.0, Adjustments to Launch Schedule, the payment schedule for the applicable launch service CLINs and SubCLINs shall be postponed for the length of the delay, if necessary, by the Government to correspond with the new launch date and the milestone events in the attached Work Plan. The requirement to make substantial progress in general conformance with the attached Work Plan, however, is not waived for any postponed launch service. In the event of a launch schedule adjustment by the Government or Contractor, the Government or Contractor shall be entitled to an equitable adjustment as determined by the contract Section C, Clause 19.0, Adjustments to Launch Schedule.
- 5.8 The Contractor agrees in the event of a termination of this contract pursuant to contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement Under FAR Clause 52.212-4(I), the Government shall not be obligated in any event to pay or reimburse the Contractor any amount in excess of the amount already obligated to the contract. The Contractor shall not be obligated to continue performance of the work beyond such point. The Government shall not be obligated in any event to pay or reimburse the Contractor in excess of the amount obligated to the contract on a quarterly basis, notwithstanding anything to the contrary in contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement Under FAR 52.212-4(I) and NFS 1852.232-77 Limitation of Funds (Fixed-Price Contract) (Mar 1989).

| Milestone / Commercial Interim Payment No. | Payment(s) Months Before Launch ¹ | Invoice Submission Dates | Amount (% of Launch Service CLIN Price) | Individual Dollar Amounts | Cumulative Amount of Launch Service Payments (\$) | Termination for Convenience of the Government Repayment Schedule – Percentage (%) of Cumulative Payments Made to Date to be Returned to Government |
|--|--|--------------------------|---|---------------------------|---|--|
| 1 | L-26 | L-27 | 10 | LV dependent | TBP | 50 |
| 2 | L-23 | L-24 | 10 | LV dependent | TBP | 50 |
| 3 | L-20 | L-21 | 10 | LV dependent | TBP | 50 |
| 4 | L-17 | L-18 | 10 | LV dependent | TBP | 55 |
| 5 | L-14 | L-15 | 10 | LV dependent | TBP | 55 |
| 6 | L-11 | L-12 | 10 | LV dependent | TBP | 55 |
| 7 | L-08 | L-09 | 10 | LV dependent | TBP | 60 |
| 8 | L-05 | L-06 | 10 | LV dependent | TBP | 60 |
| 9 | L-02 | L-03 | 10 | LV dependent | TBP | 60 |
| 10 | Launch | Launch ² | 10 | LV dependent | TBP | -- |

- ¹ The Government reserves the right to extend or shorten the above payment schedule by plus or minus three months (i.e., L-30 or L-24) at no increase in contract value to accommodate mission specific requirements. The additional L-30 payment, if required, will be 9% of the launch service price and the next nine payments will be reduced by 1% from 10% to 9%. The Launch payment shall remain unchanged at 10%. In the event the first payment is made at L-24, the first payment shall be 20% of the launch service price.
- ² The Contracting Officer will either approve the final payment within fifteen days after receipt of the final flight report, DRD C4-13 or withhold the final payment in accordance with the provisions of contract Section C, Clause 24.0. No final payment shall be made in event of partial mission success or failed mission determination by the Government in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. In the event of a partial mission success or failed mission, the final payment shall be forfeited by the Contractor and is not recoupable. In the event of a failed mission determination, 15% of the launch service price shall be applied as a credit to another launch service or be returned to the Government if it cannot be applied to a subsequent launch service. If funds are not credited or returned within thirty days of a failed mission determination, the funds shall be subject to interest penalties at the prevailing U.S. Treasury interest rate established for Prompt Payment.

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) Of the total price of CLINs [TBD] through [TBD], the sum of \$TBD is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(I) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(I) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(I) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until [TBD].
(2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,

Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to contract Section C, Clause 5.0 and Table C-1.

- (3) (i) The notice shall state the estimate when the point referred to in paragraph (c)(2) of this clause will be reached and the estimated amount of additional funds required to continue performance to the date specified in paragraph (c)(1) of this clause, or an agreed date substituted for it.
- (ii) The Contractor shall, sixty (60) days in advance of the date specified in paragraph (c)(1) of this clause, or an agreed date substituted for it, advise the Contracting Officer in writing as to the estimated amount of additional funds required for the timely performance of the contract for a further period as may be specified in the contract or otherwise agreed to by the parties.
- (4) If, after the notification referred to in paragraph (c)(3)(ii) of this clause, additional funds are not allotted by the date specified in paragraph (c)(1) of this clause, or an agreed date substituted for it, the Contracting Officer shall, upon the Contractor's written request, terminate this contract on that date or on the date set forth in the request, whichever is later, pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience".
- (d) When additional funds are allotted from time to time for continued performance of the work under this contract, the parties shall agree on the applicable period of contract performance to be covered by these funds. The provisions of paragraphs (b) and (c) of this clause shall apply to these additional allotted funds and the substituted date pertaining to them, and the contract shall be modified accordingly.
- (e) If, solely by reason of the Government's failure to allot additional funds in amounts sufficient for the timely performance of this contract, the Contractor incurs additional costs or is delayed in the performance of the work under this contract, and if additional funds are allotted, an equitable adjustment shall be made in the price(s) (including appropriate target, billing, and ceiling prices where applicable) of the items to be delivered, or in the time of delivery, or both.
- (f) The Government may at any time before termination, and, with the consent of the Contractor, after notice of termination, allot additional funds for this contract.

- (g) The provisions of this clause with respect to termination shall in no way be deemed to limit the rights of the Government under the Termination for Cause clause of this contract. The provisions of this Limitation of Funds clause are limited to the work on and allotment of funds for the items set forth in paragraph (a) of this clause. This clause shall become inoperative upon the allotment of funds for the total price of said work except for rights and obligations then existing under this clause.
- (h) Nothing in this clause shall affect the right of the Government to terminate this contract pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract.

7.0 SECURITY FOR LAUNCH SERVICE PAYMENT FINANCING (APPLICABLE TO CLINs 1 THROUGH 10)

- 7.1 *Requirements for payment.* Payments will be made under this contract upon submission of properly certified invoices or vouchers by the Contractor, and approval by the administering office, NASA John F. Kennedy Space Center. The amount of all invoices or vouchers submitted shall not exceed the total contract price for all CLINs, authorized LSTOs issued under the IDIQ contract, and special task assignments (studies and analyses).
- 7.2 *Security.* Pursuant to FAR Subpart 32.202-4 Security for Government Financing and 10 U.S.C. 2307(f) and 41 U.S.C. 255(f), the Government is required to obtain adequate security for Government financing. Adequate security for payments made under this contract shall be required in the form of a preferred creditor's lien. The Contractor shall grant the Government a preferred creditor's lien i.e., a first lien paramount to all other liens against all work in process sufficient to recompense the Government for all monies advanced under this contract should the Contractor's performance prove to be materially unsatisfactory.
- 7.3 *Insurance.* The Contractor represents and warrants that it maintains with responsible insurance carriers (1) insurance on plant and equipment against fire and other hazards to the extent similar properties are usually insured by others operating plants and properties of similar character in the same general locality; (2) adequate insurance against liability on account of damage to persons or property; and (3) adequate insurance under all applicable workers' compensation laws. The Contractor agrees that, until work under this contract has been completed and all payments made under this contract have been liquidated, it will maintain this insurance and furnish any certificates with respect to its insurance that the administering office may require.
- 7.4 *Representations and Warranties.* The Contractor represents and warrants the following:

- (A) The balance sheet, the profit and loss statement, and any other supporting financial statements furnished to the administering office fairly reflect the financial condition of the Contractor at the date shown or the period covered, and there has been no subsequent materially adverse change in the financial condition of the Contractor.
- (B) No litigation or criminal or civil proceedings are presently pending or threatened against the Contractor, which would jeopardize performance under this contract, except as shown in the financial statements.
- (C) The Contractor has disclosed all contingent liabilities in the financial statements furnished to the administering office.
- (D) None of the terms in this clause conflict with the authority under which the Contractor is doing business or with the provision of any existing indenture or agreement of the Contractor.
- (E) The Contractor has the power to enter into this contract and accept payments, and has taken all necessary actions to authorize the acceptance under the terms of this contract.
- (F) The assets of the Contractor are not subject to any lien or encumbrance of any character, which would jeopardize performance under this contract, except for current taxes not delinquent and except as shown in the financial statements. There is no current assignment of claims under any contract affected by these payment provisions.
- (G) All information furnished by the Contractor to the administering office in connection with each request for payment is true and correct.
- (H) These representations and warranties shall be continuing and shall be considered to have been repeated by the submission of each invoice for payments.

7.5 **Work Plan Submission.** The Contractor shall comply with the Work Plan that identifies the major milestone events and a corresponding narrative of the work activity necessary to accomplish the major milestone events.

8.0 SCOPE OF WORK – SPECIAL TASK ASSIGNMENTS (STUDIES AND ANALYSES) (CLIN 10)

8.1 It is contemplated the total hours in CLIN 10 will be allocated to launch services on an as-required basis. To accomplish this work, the Contractor shall perform specific task assignments that will be defined through the issuance of task orders in accordance with contract Section C, Clause 9.0, Ordering Procedure and

Payment for Special Task Assignments (Studies and Analyses) (CLIN 10) and paragraphs 8.2, 8.3, 8.4, and 8.5 herein.

- 8.2 In the performance of all Firm-Fixed-Price (FFP), completion-basis, non-LSTOs assigned under this contract, the Contractor may be required to expend a cumulative total of not more than 500,000 hours under CLIN 10 in support of east and west coast missions of fully burdened direct labor (which includes all direct and indirect cost and profit) at the FFP composite hourly labor rate stated in contract Section B, paragraph 1.5. Requirements for materials, subcontracted efforts, and hardware fabrication may be authorized and negotiated separately on a case-by-case basis by the Contracting Officer under individual task orders in addition to the FFP labor hours.
- 8.3 Only hours expended against specific written task orders authorized by the Contracting Officer shall be paid under this contract. Task orders shall be performed on an FFP, completion-effort basis. The Government is under no obligation to reimburse the Contractor for any costs, which exceed the maximum hours under CLIN 10 or the number of hours authorized on each task order.
- 8.4 The Government may require Special Task Assignments (Studies and Analyses) in any calendar year from 2006 through 2008 at the FFP composite labor rates identified in Section B, paragraph 1.5, and in any calendar year from 2009 through 2010 at the NTE prices identified Section B, paragraph 1.5, up to 500,000 hours of fully burdened labor (including all direct and indirect cost and profit).
- 8.5 The Contractor shall submit a price proposal update to convert NTE CY 2009 – 2010 labor rates into FFP labor rates at least 180 days prior to the end of CY 2008. The proposed labor rates shall be negotiated using the applicable procedures of FAR Part 15 and incorporated herein.

9.0 ORDERING PROCEDURE AND PAYMENT FOR SPECIAL TASK ASSIGNMENTS (STUDIES AND ANALYSES) (CLIN 10)

- 9.1 Performance under this contract effort shall be subject to the following ordering procedure:
- (A) The Contractor shall incur hours under CLIN 10 of this contract only in the performance of task orders and revisions to task orders issued in accordance with this ordering procedure. No other costs or hours under CLIN 10 are authorized. Task orders shall be performed under an FFP completion-basis unless specifically authorized otherwise by the Contracting Officer.
- (B) During the term of this contract, task orders will be issued in writing by the Contracting Officer to the Contractor providing direction which fills in detail

for specific work or otherwise completes the general description of the work within the scope of CLIN 10.. Each task order will indicate the objective(s) and/or desired results of each special task assignment.

- (C) Task orders will contain, as a minimum, the following information:
 - (i) Signature of the Contracting Officer
 - (ii) Contract number, task order number, and date
 - (iii) Title and description of work requested
 - (iv) Total price, including the number of labor hours, travel and material estimates, and other resources authorized
 - (v) Delivery schedule and documentation requirements
 - (vi) Quality assurance standards, as appropriate
 - (vii) Any other necessary information
- (D) The Contractor shall construe each task order as formal direction and authorization to proceed with the implementation of each special task assignment. The Contracting Officer may modify a task order in the same manner as it is issued via formal amendments.
- (E) Within thirty (30) calendar days after receipt of each task order Request For Proposal (RFP) and Statement of Work (SOW), the Contractor shall submit a proposal for Government approval. The proposal shall include:
 - (i) Discussion of the technical approach for performing the work and rationale for any proposed changes to the task order.
 - (ii) Estimated date of commencement of work and any changes proposed to the schedule of performance.
 - (iii) The total price for completion of the task order including:
 - (a) The total direct labor hours estimated to complete the task.
 - (b) The travel and material estimates, if applicable.
 - (c) An estimate for subcontractors and consultants, if applicable.
- (F) The Contracting Officer shall approve, in writing, all task orders within ten working days of receipt or enter into negotiations with the Contractor.

Accepted task orders shall be definitized and incorporated by reference into the contract via contract modification. The contract modification will reflect the mutual agreement of the parties with respect to changes in contract value, funding, and any other terms deemed pertinent to the task order.

- (G) After the Contractor accepts the task order, any revisions that become necessary in the scope of work shall require Government approval prior to implementation. The Contractor shall promptly submit a revision of the task order to the Contracting Officer. Revised task orders submitted by the Contractor are subject to the review and approval of the Contracting Officer. Hours or costs incurred in excess of those authorized by the Contracting Officer shall be at the Contractor's own expense.

- 9.2 Failure to agree to any adjustment of the task order shall be a dispute under the Disputes clause. However, nothing in this clause shall excuse the Contractor from proceeding with the task order as written.
- 9.3 The price for effort under the CLIN 10 will be paid upon satisfactory completion of each individual special task assignment.

10.0 RESERVED

11.0 FAR 52.216-18 ORDERING (OCT 1995) [Note: Applicable to IDIQ contract portion only]

- (a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from the effective date of the contract through the second quarter of calendar year 2010 (June 30, 2010).
- (b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.
- (c) If mailed, a delivery order or task order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

12.0 FAR 52.216-19 ORDER LIMITATIONS (OCT 1995) [Note: Applicable to IDIQ contract portion only]

- (a) *Minimum order.* When the Government requires supplies or services covered by this contract in an amount of less than:

- (1) One Launch Service, or
- (2) One Special Task Assignment, or
- (3) One Non-Standard Service

The Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

- (b) *Maximum order.* The Contractor is not obligated to honor—

- (1) During any calendar year, any order for a single item in excess of
12 Launch Services or;
Special Task Assignments or
Non-Standard Services exceeding the amount identified in (2)
- (2) Any order for a combination of items in excess of \$1,000,000,000; or
- (3) A series of orders from the same ordering office within thirty (30) days that together call for quantities exceeding the limitation in paragraph (b) (1) or (2) of this clause.

- (c) Reserved

- (d) Notwithstanding paragraphs (b) and (c) of this clause, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order(s) is returned to the ordering office within thirty (30) days after issuance, with written notice stating the Contractor's intent not to ship the item(s) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

13.0 52.216-22 INDEFINITE QUANTITY (OCT 1995) [Note: Applicable to IDIQ contract portion only]

- (a) This is an indefinite-quantity contract for the supplies or services specified and effective for the period stated, in Section B and C of the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.
- (b) Delivery or performance shall be made only as authorized by orders issued in accordance with contract Section C, Clause 11.0, FAR 52.216-18,

Ordering (Oct 1995). The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum." The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum."

- (c) Except for any limitations on quantities in contract Section C, Clause 12.0, FAR 52.216-19 Order Limitations (Oct 1995) or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.
- (d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, the Contractor shall not be required to make any deliveries under this contract after December 31, 2012.

14.0 LAUNCH SERVICE TASK ORDERING PROCEDURES [Note: Applicable to IDIQ contract portion only]

14.1 *Requirements for Competition.* The intent of IDIQ is to support missions in addition to the awarded missions. The Government will provide all multiple award Contractors a fair opportunity to be considered for task orders issued under this contract based upon the specific task order requirements, unless the Contracting Officer determines that one of the following apply:

- (A) The Agency need is of such urgency that competing the requirements among Contractors would result in unacceptable delays
- (B) Only one Contractor is capable of providing the service requested at the level of quality required because the service ordered is unique or highly specialized
- (C) The order should be issued on a sole-source basis in the interest of economy and efficiency as a logical follow-on to an order issued under the contract, provided that all Contractors were given a fair opportunity to be considered for the original order; or
- (D) It is necessary to place an order to satisfy the minimum guarantee.

14.2 Types of Task Orders

There are two types of task orders that may be issued under this contract. The first type is an LSTO. Any required services related to a specific launch service will be included in the LSTO. All items other than launch services and items not related to a specific launch service will be obtained by task orders referred to herein as Special Task Assignments (Studies and Analyses).

14.3 Launch Service Task Orders

- (A) *Requests for Launch Service Proposals (LSPs)*. Prior to the issuance of a request for LSP, exchanges and fact-finding may take place with multiple award Contractors. The request for LSP will include specific information unique to the mission such as payload mass and volume; orbital requirements (such as altitude and/or inclination); target launch date and science window, if appropriate; and any unique payload design considerations.

The request for LSP will provide any special instructions regarding the level of detail required in the proposal. The request for LSP will include a date and time for submission of the proposal. Proposals will be due within thirty (30) calendar days from the date of the request for LSP unless stated otherwise. The Contractor shall submit one original and five copies of the LSP to the Contracting Officer.

- (B) *Launch Service Proposal*. The Contractor, when submitting an LSP, shall indicate the LSP is compliant with the contract terms, statement of work, and the specific requirements contained in the request for LSP.

Pricing for all LSPs shall not exceed the prices contained in the Schedule. The prices contained in the Schedule are prices, which can be adjusted downward by the Contractor for the specific launch service being proposed. Any Contractor proposed reduction will be applicable to the current LSP only and will not be deemed as a permanent reduction of the prices contained in the Schedule. Any mission unique modifications not priced in the non-standard services must be separately identified and individually priced, and are not limited by the unit price in the Schedule.

The proposed launch service price, including applicable priced non-standard services and mission uniques shall be totaled for a single firm-fixed price for all efforts required under the order for that launch service. The total firm fixed-price shall be applied to the percentages in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, for conversion to dollar amounts for each payment event. In addition, the Work Plan milestones shall be appropriately modified to add any non-standard and/or mission unique services.

- (C) *Mandatory Proposal Submission.* Unless otherwise agreed to by the Contracting Officer, it is mandatory for contract holders under multiple award NLS contracts to respond to each order for launch service requirements provided these requirements are identified in the schedule and do not conflict with the contract ordering limitations. In the event there arises legitimate reasons for an awardee not to submit a proposal for a particular launch service task order (e.g., limited capacity to perform, excessive performance capability) the Contracting Officer may waive the requirement for proposal submission.
- (D) *LSP Evaluation/LSTO Selection Criteria.* All LSPs shall be submitted by the date and time specified in the request for LSP, or it will be treated as a late proposal in accordance with FAR 52.215-1, Instructions to Offerors – Competitive Acquisition.

If this requirement is met, the Contracting Officer will consider the following three factors prior to award of an LSTO:

- (i) Technical capability/risk, including the following:
- (a) Contractor's ability to meet SOW and specific payload requirements, including launch period and launch date
 - (b) Launch vehicle qualification or reasonableness of the Offeror's plan to obtain qualification prior to mission launch
 - (c) Information gained through Government insight and approval activities
 - (d) Status of significant baseline vehicle changes and resolution of anomalies
 - (e) Unique terms and conditions contained in a contract, which may impact price, performance or risk
 - (f) Proposed launch vehicle's demonstrated flight experience
- (ii) Reasonableness of proposed price, including any proposed quantity discounts, probable cost impacts to the Government as a result of technical risks introduced by the LSP, and any increased price to the Government associated with any proposed launch locations or other launch service provider unique processing requirements.
- (iii) Past performance, with emphasis given to the most recent and more relevant experience, including small business achievements.

The Requests for Launch Service Proposals shall state, whether all evaluation factors other than cost or price, when combined, are—

- (i) Significantly more important than cost or price;
- (ii) Approximately equal to cost or price; or
- (iii) Significantly less important than cost or price.

The Government reserves the right to modify the evaluation criteria for individual LSTOs. The final evaluation criteria will be defined in the request for LSTO proposal. In any event, the Government intends to award an LSTO to the Contractor who provides the best value in launch services that meet the Government's requirements.

- (E) *Award of an LSTO.* Each of the IDIQ Contractors will be notified of the Government's award of an LSTO. Pursuant to FAR 16.505(a) (7), a task order award, or proposed award, is not subject to protest except on the grounds that the order increases the scope, period, or maximum value of the contract. The debriefing requirements of FAR 15.5 are not applicable to orders issued under this contract. However, the Government intends to provide feedback to the other Contractors regarding any significant issues resulting in their non-selection.
- (F) *Modifications to LSTOs.* After an LSTO is issued, it may be necessary to add priced non-standard services to the LSTO. These additions will be accomplished via modifications to the original LSTO. In addition, mission uniques that are not included in the priced non-standard services may be added to, or deleted from, LSTOs via modification to the original LSTO. In this instance, the terms of the existing LSTO, such as price, milestone events, and Work Plan completion criteria, may be modified to reflect the change. The remainder of the price of the modification will be applied to the remaining payment milestone event amounts, as performance dictates.
- (G) *Task Order Authorization and Content.* The only persons authorized to issue task orders under this contract are the KSC Contracting Officers. Task orders will be issued in writing. However, any facsimile, or electronic, task orders issued by the Contracting Officer will be confirmed in writing within five (5) business days. The Contractor will acknowledge receipt and acceptance of the task order by signing the task order and returning it to the Contracting Officer. Each task order will include the following information:
 - (i) Date of the task order
 - (ii) Contract number and task order number

- (iii) Statement of Work and any other documentation on which the price is based
- (iv) Product or service to be delivered
- (v) Task order price
- (vi) Completion/Delivery date
- (vii) Accounting and appropriation data
- (viii) Any other necessary information

15.0 PRESERVATION, PACKING, PACKAGING, AND MARKING FOR DOCUMENTATION

Preservation, packing, packaging and marking for shipment of all items ordered hereunder shall be in accordance with commercial practice and adequate to insure safe transportation, acceptable by common carrier, and transportation at the most economical rate(s). The Contractor shall place identical requirements on all subcontracts for items delivered to NASA.

16.0 FAR 52.246-11 HIGHER LEVEL CONTRACT QUALITY REQUIREMENT (FEB 1999)

The Contractor shall comply with the higher-level quality standard selected below.

| | Title | Number | Date | Tailoring |
|-------------------------------------|---------------|-----------|------|------------------------------------|
| <input checked="" type="checkbox"/> | ISO | 9001/2000 | 2000 | Third Party Certification Required |
| <input checked="" type="checkbox"/> | Aerospace QMS | AS9100 | 2001 | |

17.0 INSPECTION SYSTEM RECORDS

The Contractor shall maintain records evidencing inspections in accordance with the Inspection clauses of this contract for one year after delivery of all items and/or completion of all services called for by the contract.

18.0 RESERVED

18.1 Reserved

Table C-2: Reserved

Table C-3: Reserved

Table C-4: Reserved

18.2 Reserved

19.0 ADJUSTMENTS TO LAUNCH SCHEDULE

- 19.1 The Government/Contractor will give written notice of any desired change in the launch schedule as soon as possible. In the case of a request for postponement of the launch date by the Government/Contractor, the Government/Contractor will propose a new launch date. Within two weeks of receipt of the written request of a launch schedule adjustment, the Government/Contractor will inform the Contractor/Government whether a launch opportunity exists as requested or will propose an alternatively available launch date. The Government/Contractor has thirty (30) days following receipt of the Contractor's/Government's proposition to give its written agreement. If mutual agreement on the revised launch date cannot be reached due to a Range conflict, resolution between the parties shall be handled by the Current Launch Schedule Review Board (CLSRB) in accordance with Air Force Space Command Instruction (AFSPCI) 10-120113. If mutual agreement on the revised launch date cannot be reached due to launch vehicle or payload readiness, resolution between the parties shall be handled per the Disputes Clause, FAR 52.233-1.
- 19.2 Once payment(s) of the standard launch service price has been made, postponement requests by the Government/Contractor shall not exceed a total of twelve (12) months, exclusive of any applicable grace period, for each party under this contract clause. In the event of a single postponement, or cumulative postponements for each launch service by the Government/Contractor exceeds twelve (12) months, the contract shall be subject to equitable adjustment for that portion of delay exceeding twelve (12) months in addition to the maximum postponement fees for the twelve month delay, and/or other available remedies provided for under contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement Under FAR 52.212-4(l), and contract Section C, Clause 1.0(m), Termination for cause. Alternatively, requests for adjustments to the launch schedule occurring greater than twenty-seven (27) months prior to the launch date shall be subject to equitable adjustment. Any delay declared by the Government, which results in a launch date later than the contract period of performance shall be subject to an equitable adjustment.
- 19.3 If the Contractor requests a postponement of the launch date and the Government agrees to the postponement, the Parties agree that, in lieu of Termination for cause and in place of actual damages, and as fixed, agreed, and liquidated damages, the price of each applicable launch service shall be reduced,

dependent upon when receipt of the notification is received, for each calendar day of delay in excess of the grace period by the amount as shown in Table C-5. In this event, the Government shall have the right of approval of the revised launch date prior to its implementation. The Government shall also have the right of approval of the reallocation of launch vehicles if milestone payments have already been made towards a designated launch vehicle. Finally, the Government shall have the right of approval prior to any revision in its position (i.e., the order in the Contractor's launch manifest queue sequence, if it results in the postponement of the Government launch date).

- 19.4 If the Contractor fails to request a postponement and the major program milestone event designated as the launch is delayed (i.e., the launch service is not completed by the contractual required time of delivery launch date), for reasons other than those excusable delays described in paragraph 19.9, then the Contractor shall pay the Government for each day of delay the maximum liquidated damages, cumulatively not to exceed \$3,650,000 for each launch service under this contract. Alternatively, if delivery or performance is so delayed by the Contractor, the Government may terminate this contract in whole or in part under contract Section C, Clause 1.0(m), Termination for cause, of this contract and in that event, the Contractor shall be liable for fixed, agreed, and liquidated damages accruing until the time the Government may reasonably obtain delivery or performance of similar supplies or services, up to the maximum specified in Table C-5. The liquidated damages shall be in addition to any other costs under contract Section C, Clause 1.0(m), Termination for cause.
- 19.5 Each postponement request by the Contractor that is not the result of paragraph 19.9 herein is subject to the liquidated damages shown in Table C-5. The delay damages are calculated on a per mission basis.

Offerors shall neither propose decreases to the dollar amounts shown in Table C-5 nor increases to the number of days specified in the Grace Periods in Table C-5.

| Contractor Liquidated Damages and Grace Periods | | | |
|--|---|---|------------------------------------|
| During Months Prior to Launch Date - First Day to Last Day (Months) | Liquidated Damages Paid to Government for Each Day of Launch Delay | Maximum Liquidated Damages Paid By the Contractor (\$) | Grace Period (Days) |
| | (\$) | | |
| L-27 through L-25 | 1,000 | 365,000 | 150 |
| L-24 through L-13 | 2,000 | 730,000 | 120 |
| L-12 through L-7 | 3,000 | 1,095,000 | 90 |
| L-6 through L-4 | 5,000 | 1,825,000 | 60 |
| L-3 through L-11 Days | 10,000 | 3,650,000 | 30 |
| L-10 Days through Launch | 10,000 | 3,650,000 | 7 |

Table C-5: Contractor Liquidated Damages and Grace Periods

The maximum amount paid for delays (in excess of the grace period) by the Contractor shall not exceed a total of \$3,650,000. A grace period is defined as the number of days the Contractor may delay the launch date, without incurring liquidated damages.

- 19.6 If the Government requests a postponement of the launch date, the Parties agree that, in place of actual damages, and as fixed, agreed, and liquidated damages, the price of each applicable launch service shall be increased, dependent upon when receipt of the notification is received, for each calendar day of delay in excess of the grace period by the amount as shown in Table C-6. Each postponement request by the Government that is not the result of paragraph 19.9 is subject to the postponement fees shown in Table C-6.

Offerors may propose, in Table C-6, increases or decreases to the dollar amounts shown in Table C-5 or increases only to the number of days specified in the Grace Periods in Table C-5. See additional instructions in Attachment E2.

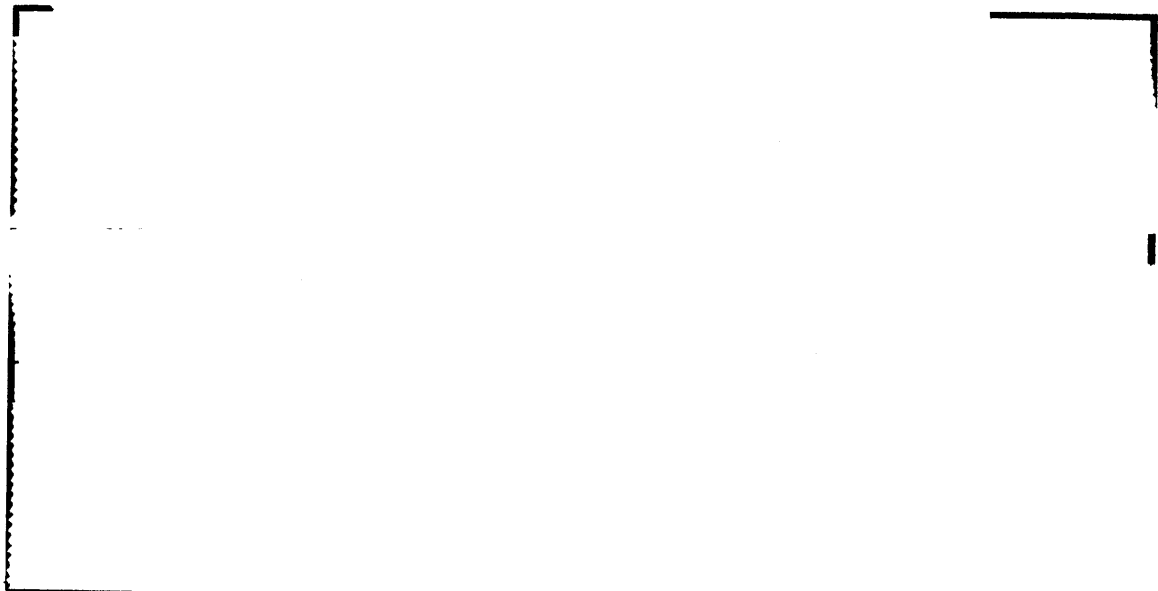


Table C-6: Government Postponement Fees and Grace Periods

- 19.7 The maximum amount paid for delays (in excess of the grace period) by the Government shall not exceed a total of \$3,650,000. A grace period is defined as the number of days the Government may delay the launch date without incurring postponement fees.
- 19.8 In the event that the Government/Contractor postpones the launch date, the payment schedule shall be suspended for the length of the delay and then resumed with all remaining payments shifted by the amount (length) of the delay. For Government delays only, the Contractor may elect to receive payments as major program milestone events are completed in lieu of the payment of postponement fees, provided funding is available and obligated to the contract.
- 19.9 The Government/Contractor will not be charged with postponement fees/liquidated damages when the delay in delivery or performance arises solely out of causes beyond the control of the Government/Contractor and not due to the fault or negligence of the Government/Contractor. Such causes include, but are not limited to the following:

Delays resulting from mission rule requirements, Range launch constraints, Range mandatory hold requirements, acts of God, acts (including delay or failure to act) of any Governmental authority (De Jure or De Facto), wars (declared or undeclared), riots, revolution, hijacking, fires, freight embargoes, sabotage, epidemics and

interruptions of essential services such as electricity, natural gases, fuels and water, or any condition which jeopardizes the safety of the employees of the Contractor, the Government, or its subcontractors; or a launch vehicle failure investigation, provided the Government retains its original position in the order of the queue sequence and that all data related to the failure investigation is made available to the Government without restriction.

- 19.10 Once a specific launch date and time have been established, they may be changed by the cumulative amount of the grace period established above by the Government or the Contractor without consideration to the other party if the mission requirements can be met. The cumulative total of grace periods exercised by either the Government or the Contractor shall not exceed 150 days.
- 19.11 The amount of postponement fees shall be added to/subtracted from (as applicable) the next milestone payment made pursuant to the contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria. In addition, the delivery schedule shall be adjusted to reflect the revised launch date.
- 19.12 In the event of an anomaly on a previous mission of the same launch vehicle (including a non-NASA mission), the Government reserves the right to delay the launch service, until the next available launch opportunity, without accruing damages or providing an equitable adjustment to the Contractor until resolution of the anomaly.
- 19.13 This clause, including grace periods, shall not apply to missions with scientific and planetary launch windows and/or planetary and lunar exclusion periods. Requests for launch adjustments for missions with scientific and planetary launch windows and/or planetary and lunar exclusion periods shall be in accordance with the "Changes" clause of this contract. Contractor requests for launch adjustments for missions with scientific and planetary launch windows and/or planetary and lunar exclusion periods are subject to equitable adjustment and require approval of the Government prior to implementation. If Government approval is granted, the Contractor shall be obligated to launch at the next available scientific opportunity and planetary launch window, irrespective of other launch commitments or customer's priorities.

20.0 PLACE OF PERFORMANCE

The place of performance and launch site will be identified in each launch service or task order. The delivery schedule and/or period of performance of this contract are based upon the launch dates specified in the schedule or each individual task order.

21.0 ACCOUNTING AND APPROPRIATION DATA

| UPN | Requisition Number | Funding Citation | Previous Contract Obligation (\$) | This Contract Obligation (\$) | Total to Date Contract Obligation (\$) |
|-----|--------------------|------------------|-----------------------------------|-------------------------------|--|
| TBD | | | | | |
| | | | | | |

Table C-7: Accounting and Appropriation Data

22.0 NFS 1852.227-72 DESIGNATION OF NEW TECHNOLOGY REPRESENTATIVE AND PATENT REPRESENTATIVE (JULY 1997)

- (a) For purposes of administration of the clause of this contract entitled "New Technology" or "Patent Rights—Retention by the Contractor (Short form)," whichever is included, the following named representatives are hereby designated by the Contracting Officer to administer such clause:

| Name | Title | Mailcode | Address |
|------------|-------------------------------|----------|--|
| D. Makufka | New Technology Representative | KT-F | John F. Kennedy Space Center, NASA Kennedy Space Center, FL 32899 |
| R. Heald | Patent Representative | CC-A | John F. Kennedy Space Center, NASA Kennedy Space Center, FL 32899 |

- (b) Reports of reportable items, and disclosure of subject inventions, interim reports, final reports, utilization reports, and other reports required by the clause, as well as any correspondence with respect to such matters, should be directed to the New Technology Representative unless transmitted in response to correspondence or request from the Patent Representative. Inquiries or requests regarding disposition of rights, election of rights, or related matters should be directed to the Patent Representative. This clause shall be included in any subcontract hereunder requiring a "New Technology" clause or "Patent Rights—Retention by the Contractor (Short Form)" clause, unless otherwise authorized or directed by the Contracting Officer. The respective responsibilities and authorities of the above-named representatives are set forth in 1827.305-370 of the NASA FAR Supplement.

23.0 USE OF GOVERNMENT PROPERTY, FACILITIES, AND ASSETS

- 23.1 The Contractor shall obtain and maintain any necessary agreements between the Contractor and any Government Agency authorizing the use of Government property, facilities, assets or services required in performance of this contract.
- 23.2 The Government makes no warranty whatsoever as to the suitability for use of Government property, facilities and other assets made available under the terms and conditions of any Government use agreements or contracts. Any costs necessary to maintain, restore, refurbish, and/or replace any assets, for use under this contract, shall result in no increase in the price of this contract.
- 23.3 The Contractor is responsible for determining the suitability for use of all materials, property, and facilities acquired or made available to the Contractor by the Government under any contract agreement. Any use of Government-Furnished Property (GFP), materials, or facilities and services shall not relieve the Contractor of full launch service performance responsibility.

24.0 MISSION SUCCESS DETERMINATION, INVESTIGATION, AND CORRECTIVE ACTIONS

24.1 Mission Success Criteria

- (A) A mission will be determined a *Mission Success*, whether or not the payload performs its intended mission, if:
- (i) The payload is placed into the required orbit by the LV, and
 - (ii) Received telemetry data shows the Interface Control Document (ICD) environments and parameters were not exceeded, and
 - (iii) The LV causes no damage to the payload during deployment or thereafter from collision or contamination products.
- (B) A mission will be determined a *Partial Mission Success* if:
- (i) The payload is not placed into the required orbit, but evaluation of the payload's capabilities and longevity at the actual orbit meets 70% or more of the Payload Evaluation Criteria four (4) months after launch, or
 - (ii) Received telemetry data shows the ICD environments and parameters were exceeded (or no confirming telemetry data were received), but evaluation of the payload's capabilities and longevity meets 70% or more of the Payload Evaluation Criteria four (4) months after launch, or

- (iii) The payload is damaged during deployment or thereafter from collision or contamination products, but evaluation of the payload's capabilities and longevity at the actual orbit meets 70% or more of the Payload Evaluation Criteria four (4) months after launch.

(C) A mission will be determined a *Failed Mission* if the payload:

- (i) Is destroyed during launch, or
- (ii) Cannot be separated from the LV, or
- (iii) Is not placed into the required orbit and evaluation of the payload's capabilities and longevity at the actual orbit meets less than 70% of the Payload Evaluation Criteria four (4) months after launch, or
- (iv) Is subjected to environments or parameters which exceed the ICD and evaluation of the payload's capabilities and longevity meets less than 70% of the Payload Evaluation Criteria four (4) months after launch, or
- (v) Is damaged during deployment or thereafter from collision or contamination products by the LV and evaluation of the payload's capabilities and longevity meets less than 70% (directly attributable from damage from LV) of the Payload Evaluation Criteria four (4) months after launch.

24.2 Mission Success Determination

(A) The LSPO, along with the payload customer, will establish the Payload Evaluation Criteria. The Payload Evaluation Criteria will consist of:

- (i) The payload orbit/attitude ranges determined necessary to obtain data sufficient to meet 70 percent or more of the mission's objectives, and
- (ii) A list of payload systems which, individually and/or in combination, are required to operate successfully in order to achieve 70 percent or more of the mission's objectives, and
- (iii) A list of payload instruments which, individually and/or in combination, are required to operate successfully in order to achieve 70 percent or more of the mission's objectives.

(B) The Contractor shall be responsible for providing telemetry data confirming the required orbit conditions and payload environments were met as stated in the ICD. The Contractor shall measure and provide telemetry data to the extent required by the SOW. The Government will be responsible for providing data supporting payload capability status and longevity analysis.

- (C) In order to determine mission success under paragraphs 24.1(B) or 24.1(C) (iii), (iv) or (v), the Government will evaluate the payload condition four (4) months after launch. If the payload meets 70% or more of its capabilities and longevity as listed in the Payload Evaluation Criteria, the mission will be considered a partial mission success. If the payload operation is less than 70% of the capabilities and longevity as listed in the Payload Evaluation Criteria, the mission will be considered a failed mission. Note that the payload capability degradation must be directly attributable to an issue with the LV.
- (D) The Contracting Officer has authority to determine whether a launch mission is a Mission Success, Partial Mission Success, or a Failed Mission, based on the application of the Payload Evaluation Criteria.

24.3 Procedures

- (A) Not less than two (2) months prior to launch of a payload, the Contracting Officer will provide, in writing, the Payload Evaluation Criteria to the Contractor.
- (B) Within fifteen (15) days from submittal of the Final Flight Report (DRD C4-13), the Contracting Officer will either determine the launch a Mission Success or inform the Contractor of the Government's intent to withhold final payment and mission determination until the completion of the payload operability and longevity evaluation.
- (C) If the Government informs the Contractor it will withhold the final payment, the payload's operability and longevity will be assessed four (4) months from the launch date using the Payload Evaluation Criteria for mission success determination. The Government will also utilize the Final Flight Report (DRD C4-13), findings from the Contractor's investigation board, and findings from the NASA-chaired Failure Review Board (FRB) if activated. The Contracting Officer shall submit a final determination of either Partial Mission Success or Failed Mission within one (1) week of the payload evaluation. If a Partial Mission Success determination is made, an operability ranking of the payload between 70% and 100% will be included.

24.4 Performance-Based Payment for Final Mission Success Determination

- (A) In the event the Contracting Officer determines the launch service a Mission Success, the Contractor shall receive full payment of the final payment event for the launch service.

| Mission Success Determination | Payload Operability Ranking (%) | % Awarded of Final Payment | % of Total Launch Service Price Reallocated/Refunded to the Government |
|-------------------------------|---------------------------------|----------------------------|--|
| Full Success | 95-100 | 100 | 0 |
| Partial Mission Success | 70-94 | 0 | 0 |
| Failed Mission | 0-69 | 0 | 15 |

- (B) In the event the Contracting Officer determines the launch service a Partial Mission Success, the Government will pay no portion of the final payment in accordance with Table C-8.

Table C-8: Mission Success Payment Schedule

- (C) In the event the Contracting Officer determines the launch service a *Failed Mission*, the Government will pay no portion of the final payment (reference Table C-8) and the Contractor shall reallocate 15% of the total launch service (CLIN) price to another NASA mission or refund the 15% if a subsequent launch service is unavailable. Withholding of the final payment and a 15% reallocation/refund to the Government are the sole remedies of the Government for a *Failed Mission* determination.

24.5 Investigation and Corrective Action

- (A) In the event of an anomaly or failed mission, a NASA-chaired FRB will determine the cause of anomaly or failure, if activated. The FRB will evaluate all available data from the launch vehicle, payload, Range, and other sources in order to determine if the mission failure was attributable to the launch vehicle or conditions for which the Contractor would normally be expected to control or avoid. Based on the findings and recommendations of the FRB, the Government shall make the final determination as to partial mission success or failed mission. If the Contractor disagrees with the determination, the decision shall be subject to the Disputes clause of this contract.
- (B) If one or more of the ICD environmental requirements are exceeded or orbit requirements are not achieved on a particular mission, the Contractor shall investigate the anomaly or failure at its own expense. The Contractor shall determine the scope of the investigation and shall conduct and control the investigation. The Government may designate representatives to observe and participate in the Contractor's failure investigation board. If the Contractor changes the launch vehicle design, the Contractor shall provide NASA insight into the change. The Government may establish an independent assessment team to assess the Contractor's investigative and corrective actions.
- (C) The Contractor shall present to the Government its findings resulting from the investigation and the proposed corrective actions (return to flight

activities), if any. The Contractor shall be responsible for proving the corrective action is sufficient to return to flight. The Contracting Officer may either accept or reject any finding or corrective action. If the Contracting Officer accepts a finding and the related corrective action, the Contractor shall be responsible for the cost of the corrective action including re-acceptance for NASA missions. In the event the Government requires additional analyses or tests beyond those planned by the Contractor, the Contractor shall implement the Contracting Officer's written direction to perform the additional tests or analyses. The costs of implementing these additional tests or analyses may be the basis for an adjustment to this contract. The Government may, at its option and its expense, conduct its own investigation of the anomaly or failure. The Contractor shall cooperate with and fully support the Government investigation.

- (D) The Contractor shall report to NASA any flight anomalies from non-NASA missions. For non-NASA missions, the requirements of paragraphs 24.5(B) and (C) apply to these anomalies as the Contracting Officer finds them to be related to NASA missions. Rights under the Default clause and the right to require corrective action before return to flight shall also apply in the event the requirements of NPD 8610.7 are not met.

24.6 Finality of Contracting Officer's Determination

- (A) Except for the determinations described in paragraph 24.6(B), each of the Contracting Officer's Determinations, under paragraph 24.2, are subject to FAR 52.233-1, Disputes.
- (B) The following Contracting Officer's Determinations under this clause are final and not subject to FAR 52.233-1, Disputes:
 - (i) A determination the payload is not operational
 - (ii) A determination that a payload defect is not the cause of the payload being inoperable
 - (iii) A determination of the Payload Evaluation Criteria
- (C) In the event the Contractor appeals the Government decision under the Disputes clause in accordance with FAR subpart 33.2 and submits a claim under the Contract Disputes Act, the parties hereby agree the burden of proof shall rest on the Contractor to prove the failure was not due to the LV. The Contractor assumes the responsibility for providing confirming data. The Government will be responsible for providing proof of payload degradation or reduction in operational capacity or longevity.

24.7 Acceptance

Final acceptance of the launch service will be accomplished following the Contracting Officer's mission success determination.

25.0 GOVERNMENT INSIGHT AND APPROVAL

- 25.1 The Contractor shall provide NASA an adequate level of insight into and/or approval of certain Contractor tasks and milestones in order to ensure all reasonable steps have been taken that result in the highest probability of mission success. This includes insight into any corporation, corporate divisions, subsidiaries, joint ventures, partner(s) and/or any other business entity actually performing launch vehicle manufacturing, management, payload/launch vehicle integration, testing and launch. This also includes insight into certain major sub-contractor tasks and milestones (i.e., those sub-contractors that perform major portions of manufacturing or integration of the launch vehicle system).
- 25.2 The Government's monitoring of launch services provided by the private sector has two elements: approval and insight. Government approval is defined as providing authority to proceed and/or formal acceptance of requirements, plans, tests, or success criteria in specified areas. Where Government approval is required, the Contractor shall submit the necessary documentation to the Contracting Officer and copies to the Contracting Officer's Technical Representative (COTR).
- 25.3 Government insight is defined as gaining an understanding necessary to knowledgeably concur/non-concur with the Contractor's actions through watchful observation, documentation, meeting attendance, reviews, tests and compliance evaluations. Where Government insight is required, the Contractor shall notify the Contracting Officer, the Government Resident Office or the appropriate Government operations organization at the launch site of meetings, reviews, or tests in sufficient time to permit meaningful Government participation.
- 25.4 Should approval or insight identify non-compliance with the terms and conditions of the contract, a difference in interpretation of test results, or disagreement with the Contractor technical directions, the Government will take appropriate action within the terms of the contract to ensure compliance via written direction to the Contractor.
- 25.5 NASA shall have insight into any Contractor initiated fleet changes or any changes that may affect NASA missions. This insight shall be accommodated with no increase in contract price.
- 25.6 Specific areas where the Government requires approval and/or insight are listed in paragraphs 25.7 and 25.8 respectively. The paragraphs document requirements specified in NPD 8610.23a, Technical Management of Expendable Launch Vehicle (ELV) Launch Services.

25.7 Specific areas requiring Government approval are:

- (A) Payload-to-LV interface control documents/drawings.
- (B) Decisions/resolutions of action items as determined by joint NASA/Contractor mission integration working groups.
- (C) Mission unique hardware design, analysis, manufacture, and test.
- (D) Mission unique software design, analysis, and test.
- (E) The Contractor's Safety and Health, Reliability, and Quality Management Plans
- (F) Top-level test plans, requirements, and success criteria for integrated vehicle systems tests and launch site vehicle assembly and test.
- (G) Launch commit criteria.
- (H) Closeout of actions from NASA-Chaired Launch and Flight Readiness Reviews.
- (I) Payload handling procedures and deviations.
- (J) Integrated payload/vehicle mate, test, and closeout procedures and deviations.
- (K) Integrated payload/vehicle mate, test, and closeout as-run procedures and deviations.
- (L) Launch countdown procedures and deviations that affect payload/vehicle integrated assembly.
- (M) Anomaly resolutions that affect the integrated assembly.
- (N) Launch Go/No-Go.
- (O) Contractor's Risk Management Plan

25.8 Specific areas to be open to Government insight are:

- (A) Baseline vehicle design, analyses, and configuration management.
- (B) Production program reviews, plans, and schedules.
- (C) Production and systems test Material Review Boards.
- (D) Critical flight hardware pedigree.

- (E) Safety and Mission Assurance compliance evaluations (prime and subcontractors).
 - (F) Pre-ship reviews.
 - (G) Design and qualification reviews.
 - (H) Major/critical problems.
 - (I) Major system and integrated systems tests.
 - (J) Post-test data.
 - (K) Anomaly resolutions.
 - (L) Failure analysis.
 - (M) Vehicle/ground support equipment procedures.
 - (N) Launch site support work schedules and plans.
 - (O) Launch site vehicle preparations and closeout data.
 - (P) Vehicle walkdown inspections.
 - (Q) Operations and procedure discipline.
 - (R) Work practices and documentation.
 - (S) Conduct of Contractor chaired Mission, Launch, and Flight Readiness Reviews.
 - (T) Post-flight vehicle, tracking, and range data.
 - (U) Post-flight anomaly investigations/close-outs.
- 25.9 Notwithstanding the insight and approvals set forth in Clause 25.0 herein, the Contractor assumes full performance responsibility as set forth in this contract, and neither the Government's insight nor its approval under this paragraph 25 shall be construed as a defense to any finding of mission success or final acceptance / rejection of the launch service.
- 26.0 GOVERNMENT LAUNCH READINESS ASSESSMENT**
- 26.1 The Contractor shall participate in a Government-chaired Flight Readiness Review (FRR) (reference 2.2.1.3(D) of the SOW) to be held subsequent to the

Government-chaired Launch Readiness Review (LRR) and any Contractor LRR. At the FRR, the Contractor shall summarize the status of its launch vehicle and all supporting elements and attest to readiness to launch the mission. If, after due consideration of the status of the launch vehicle, payload and other launch support systems, the Government does not agree that the total mission is ready for launch, the Government has the right to delay the launch.

- 26.2 The Contractor shall poll the Government in the final launch countdown and any re-cycle procedure during status checks for their approval of the final launch readiness assessment. The Government may declare a "HOLD" and delay the launch at any time during the final launch countdown.
- 26.3 In the event the Government delays the launch, as a result of exercising its rights this clause, and the causes of the delay were within the control of or due to the fault or negligence of the Contractor or its Subcontractors at any tier, then the provisions of Section C, Clause 19.0, Adjustments to Launch Schedule shall govern and the Contractor shall be deemed to have caused the delay. For the purpose of this clause, the burden of proof for showing that the causes of delay were within the control or fault and/or negligence on the part of the Contractor or its Subcontractors at any tier rests with the Government. If the Government delays the launch beyond the grace period established in Section C, Clause 19.0 and the causes of the delay were not within the control or due to the fault or negligence of the Contractor or its Subcontractors at any tier, then the provisions of Section C, Clause 19.0, Adjustments to Launch Schedule shall apply.

27.0 LICENSES AND PERMITS FOR A LAUNCH SERVICE OPERATOR

The Contractor shall obtain and maintain the necessary licenses, permits and clearances that may be required by the Department of Transportation, Department of Commerce, Department of Defense, NASA, or other Governmental agencies in order to provide launch services under this contract. No Federal Aviation Administration commercial launch license is required under this contract. All costs and fees associated with obtaining licenses, permits and clearances are included in the standard launch service price. Approvals required by the payload are the responsibility of NASA.

28.0 ADVANCE UNDERSTANDING REGARDING TERMINATION SETTLEMENT UNDER FAR 52.212-4(I)

- 28.1 In the event the Government decides to exercise its right to terminate all or part of this contract under Section C, Clause 1.0(I), Termination for the Government's convenience, it is agreed in advance that the Contractor, after receipt of a written notice of termination, will have satisfied all obligations and discharged all duties required by Section C, Clause 1.0(I), Termination for the Government's convenience, when the Contractor has refunded that portion of the milestone-

based payment(s) for each launch service affected by the termination, in accordance with Table C-9.

- 28.2 The parties agree that by virtue of the refund specified in Table C-9, any and all claims for equitable adjustment as a result of the termination are fully satisfied and discharged. The parties agree that this settlement represents fair compensation for Contractor effort accomplished for the terminated portions of the contract and that the terms as stated herein represent full and final settlement between the parties. The parties agree that the Contractor shall retain title to all hardware associated with the terminated launch service. The parties agree that the above settlement shall represent the total amount to be paid to the Contractor without agreeing on or segregating the particular elements of costs or profits comprising this amount.
- 28.3 The refund amount shall be payable in full no later than thirty (30) days after receipt of the written notice of termination. Delinquent payment(s) shall be subject to interest at the applicable rate as determined by the Secretary of the Treasury.

| Performance Based Milestone/ Payment No. | Payment(s) Months Before Launch | Amount (% of Launch Service CLIN Price) | Cumulative Amount of Launch Service Payments (\$) | Termination for Convenience of the Government Repayment Schedule - Percentage (%) of Cumulative Payments Made to Date to be Returned to Government |
|--|---------------------------------|---|---|--|
| 1 | L-27 | 10 | TBD | 50 |
| 2 | L-24 | 10 | TBD | 50 |
| 3 | L-21 | 10 | TBD | 50 |
| 4 | L-18 | 10 | TBD | 55 |
| 5 | L-15 | 10 | TBD | 55 |
| 6 | L-12 | 10 | TBD | 55 |
| 7 | L-09 | 10 | TBD | 60 |
| 8 | L-06 | 10 | TBD | 60 |
| 9 | L-03 | 10 | TBD | 60 |
| 10 | Launch | 10 | TBD | -- |

Table C-9: Launch Payment and Termination Repayment Schedule

- 28.4 The provisions of this Contract clause shall only apply until the point of intentional ignition of the launch vehicle. The provision of this Contract clause shall in no way be deemed to limit the rights of the Government under Section C, Clause 1.0(m), Termination for Cause. In the event the Government exercises its rights

under Section C, Clause 1.0(m), Termination for Cause, the provisions of this contract clause will not apply.

29.0 CO-MANIFESTED PAYLOADS

29.1 Definitions

- (A) Primary Payload: the payload which serves to determine the launch day and time, and without which the vehicle would not launch.
- (B) Secondary Payload: any payload carried by the launch vehicle in space not required by the primary, which requires the approval of the primary payload customer prior to manifesting; or, any payload, if not ready to support scheduled launch day, which would be demanifested and replaced with a mass simulator.

29.2 NASA Secondary Payload with NASA Primary Payload

(A) Procedures

NASA may request to manifest a NASA secondary payload on a NASA primary mission. The preferred method of ordering this secondary payload service will be via non-standard service task order. If the non-standard service is not provided in the catalog for the particular launch service, the Government will submit a task order requesting a proposal for a non-standard service to accommodate a secondary payload. The Contracting Officer will provide a description of the proposed secondary payload including, as a minimum: volume, mass, attachment requirements, and data requested by the Contractor. The task order will identify any additional non-standard services or mission unique requirements.

Upon receipt of the task order, the Contractor shall develop a proposal to accommodate the secondary payload or provide a response that the Contractor cannot accommodate the secondary payload on any existing planned missions. The Contractor's proposal shall include a firm fixed-price for the secondary payload (if not ordered under a non-standard service), any additional non-standard services required, any mission unique services, and a proposed payment schedule with accomplishment criteria.

If the Government is unable to provide the secondary payload for launch vehicle integration or there is insufficient time to complete a new mission analysis before the launch date, the Government will bear the cost and the Contractor shall be responsible for designing, fabricating, and installing a secondary payload mass simulator.

In the event of termination for convenience of the NASA secondary payload services, all costs associated with terminating such service shall be determined in accordance with contract Section C, Clause 1.0(I), "Termination for the Government's convenience."

(B) Delays

Any delays shall be subject to contract Section C, Clause 19.0, Adjustments to Launch Schedule.

(C) Mission Success

Mission success determination for the NASA primary and secondary payload shall be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions with the following exception:

In the event the secondary payload causes primary mission failure, NFS 1852.228-78, Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches, shall apply and the primary mission shall be determined a full success for purposes of contract Section C, paragraph 24.2.

29.3 Non-NASA Payload with NASA Primary Payload

(A) Procedures

The Contractor may propose to manifest a non-NASA payload on a NASA primary mission. The Contractor shall propose the mission requirements and consideration to be received by NASA. The Contractor shall submit, at no cost to NASA, a detailed payload description, a dual payload compatibility assessment, and any additional documentation or analyses requested by NASA. NASA maintains the right to approve or disapprove the non-NASA payload proposed for manifesting on a NASA primary mission. The Government will respond to the Contractor's request within sixty (60) calendar days after receipt of all NASA requested documentation and analyses.

If the Contractor is unable to provide the non-NASA payload for launch vehicle integration or there is insufficient time to complete a new mission analysis before the launch date, the Contractor shall bear the cost and be responsible for designing, fabricating, and installing a secondary payload mass simulator.

(B) Delays

NASA shall incur no costs or damages associated with delaying the non-NASA mission under any circumstance. The non-NASA payload shall not cause the NASA primary mission launch date to be delayed without NASA approval. If NASA approves a launch delay caused by the non-NASA payload, the NASA Contracting Officer will unilaterally determine whether the Government will be entitled to equitable adjustment under contract Section C, Clause 19.0, Adjustments to Launch Schedule.

(C) Mission Success

Mission success determination for the NASA primary payload shall be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions with the following exception:

In the event the non-NASA payload causes primary mission failure, NFS 1852.228-78, Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches, shall apply and the primary mission shall be determined a full success for purposes of contract Section C, paragraph 24.2.

29.4 NASA Secondary Payload on a Non-NASA Primary Payload

(A) Procedures

NASA may request to manifest a NASA secondary payload on a non-NASA primary mission via a task order requesting a proposal for a non-standard service to accommodate a secondary payload. The Contracting Officer will provide a description of the proposed secondary payload including, as a minimum: volume, mass, attachment requirements, and data requested by the Contractor. The task order will also identify any additional non-standard services or mission unique requirements. If the Government is unable to provide the secondary payload for LV integration or there is insufficient time to complete a new mission analysis before the launch date, the Government will bear the cost and the Contractor shall be responsible for designing, fabricating, and installing a secondary payload mass simulator.

Upon receipt of the task order, the Contractor shall develop a proposal to accommodate the secondary payload or provide a response that the Contractor cannot accommodate the secondary payload on any existing planned missions. The Contractor's proposal shall include a firm-fixed price for the secondary payload, any additional non-standard services required, any mission unique services, and a proposed payment schedule with accomplishment criteria. The Contractor shall identify the primary mission and the target launch date for the mission. The Contractor shall make all

arrangements for and coordinate the concurrence of manifesting the secondary payload with the primary mission customer.

The terms and conditions of this contract shall apply to NASA secondary payload efforts, however the level of NASA insight and approval will be limited to those activities directly affecting the secondary payload. The Contracting Officer shall identify any additional reductions to the terms and conditions of the contract in each task order for NASA secondary payload services.

In the event of termination for convenience of the NASA secondary payload services, all costs associated with terminating such service shall be determined in accordance with contract Section C, Clause 1.0(I), "Termination for the Government's convenience."

(B) Delays

The Contractor shall incur no costs or damages associated with delaying the secondary mission. The secondary mission shall not cause the primary mission launch date to be delayed without Contractor approval. If the Contractor approves a launch delay caused by the secondary payload, delay damages shall not apply.

(C) Mission Success

Mission success determination for the NASA secondary payload shall be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions with the following exception:

In the event the primary payload causes secondary mission failure, NFS 1852.228-78, Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches, shall apply and the secondary mission shall be determined a full success for purposes of contract Section C, paragraph 24.2.

29.5 Contractor Risk Determination for NASA Secondary Missions

Upon receipt of task order, the Contractor shall, as part of NASA secondary payload integration activities, perform a payload compatibility assessment for all manifested NASA secondary payloads. The Contractor shall notify the Contracting Officer, in writing if, in the Contractor's opinion, the NASA secondary payload would pose unacceptable risk to the success of the primary mission. The notification shall provide detailed substantiation of said risks.

In the event the Contractor, or the primary mission Customer, determines the risk is unacceptable, the Contractor and the Contracting Officer will mutually agree to terminate the task order or re-manifest the NASA secondary payload on another mission. In the event the task order is terminated, NASA will only be liable for the cost of the compatibility analysis and any other payments made to the Contractor shall be repaid to the Government or reallocated to another mission.

30.0 EXPORT CONTROL AND FOREIGN NATIONALS

- 30.1 The Contractor shall comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130, and the Export Administration Regulations (EAR), 15 CFR Parts 730-744, in the performance of this contract. The Contractor shall be responsible for obtaining export licenses, where required.
- 30.2 The Contractor shall be responsible for obtaining the required export licenses before utilizing foreign nationals in the performance of this contract, including instances where the work is to be performed at launch sites. NASA will be responsible for all ITAR requirements for their foreign national customers, as applicable.
- 30.3 The Contracting Officer, or designated representative, may authorize the Contractor to export ITAR-controlled technical data pursuant to the exemption set forth in 22 CFR 125.4(b)(3) where an international agreement provides for the export of such data and the data does not disclose the details of the design, development, production or manufacture of any defense article.

31.0 DOMESTIC SOURCE CRITERIA

- 31.1 In addition to the certification regarding United States commercial provider of space transportation services (Public Law 105-303, Title II, Section 201), the Contractor shall continue to comply with domestic source criteria. Failure to comply with the criteria may be grounds for "Termination for Cause" in accordance with contract Section C, Clause 1.0(m).
- 31.2 Participation in this procurement is restricted to prime Contractors from the United States LV/services industry. "United States industry" means any corporation, partnership, joint venture, association, or other entity which is organized or existing under the laws of the United States or any State, and whose controlling interest is held by United States citizens. "Launch services" means all services required in the performance of this contract, excluding those necessary to produce or manufacture launch vehicles, its components and other equipment and facilities required in the performance of the contract. "Controlling interest" means ownership of an amount of equity in such entity sufficient to direct management or to void transactions entered into by management.

Ownership of at least fifty-one (51) percent of the equity creates a reputable presumption that such interest is controlling.

- 31.3 The Contractor shall provide in the performance of this contract launch vehicles that are domestic end products. The LV shall be a domestic end product only if the cost of its components, mined, produced or manufactured in the United States exceeds 50 percent of the cost of all its components. The cost of each component includes transportation costs to the place of incorporation into the LV and any applicable duty (whether or not a duty-free entry certificate is issued). "Components," as used in this contract clause, means those materials and supplies directly incorporated into the end product.
- 31.4 The Contractor shall provide, in the performance of this contract, domestic launch services. Launch services shall be considered to be domestic if the cost for launch services performed by United States industry sources exceeds 50 percent of the cost of the total required launch services.

32.0 LIABILITY FOR THIRD PARTY CLAIMS

- 32.1 This contract clause applies to Third Party claims that arise out of the conduct of hazardous launch activities during the provision of launch services under this contract. More specifically, this contract clause allocates between the Government and the Contractor the risk of Third Party claims for damage to or loss of property or personal injury or death arising from the burning, explosion, detonation, combustion or impact of an LV, its payload, or a component thereof, whether or not the payload is separated from the LV, from the time of launch until thirty (30) days after launch.

32.2 Definitions

Covered Launch Activities: Any and all activities involved in the preparation of a launch vehicle and payload for launch, and conduct of the launch, when those activities take place at a launch site in the United States.

Launch: The intentional ignition of the first-stage motor(s) of the LV that has been integrated with the payload.

Launch Vehicle: The baseline LVS consisting of a common core booster section and any strap on motors attached, one (1) interstage, an orbital adjust module, the payload fairing and the payload adapter.

Party or Parties: The Contractor or NASA, or both.

Payload: All NASA or NASA-sponsored equipment that has been integrated with the LV for transportation into earth orbit or escape trajectories.

- Related Party: (i) Any of the Parties' directors, officers, agents, employees or customers
- (ii) Any of the Parties' contractors, subcontractors, or suppliers at any tier involved directly or indirectly in the performance of this Contract
- (iii) Any entity having any right, title or interest, whether through sale, lease or service arrangement or otherwise, directly or indirectly, in the payload, the LV, or the launch service value

Third Party: Any person or entity other than NASA, the Contractor and Related Parties.

32.3 Required Insurance for Liability to Third Parties

- (A) The Contractor shall continue in effect or acquire insurance to protect the Parties and the Related Parties from liability for claims from Third Parties for damage to or loss of property or personal injury or death arising in connection with the covered launch activities under this contract. The amount of the required insurance shall be the maximum amount available in the commercial marketplace at reasonable cost, but shall not exceed \$500 million for each launch. The policy or policies shall name NASA and the related parties as additional insurers. Required insurance coverage shall attach no later than the arrival of the LV at the launch site and shall remain in force for at least thirty (30) days following launch.
- (B) The Contractor shall provide acceptable evidence to the Contracting Officer of required insurance no later than thirty (30) days prior to the beginning of the covered launch activities. The amount of required insurance and the terms and conditions for the policy or policies shall be subject to review by the Contracting Officer. Once reviewed, the policy or policies may not be modified or canceled without the prior, written approval of the Contracting Officer.
- (C) The foregoing insurance requirement does not preclude the Contractor from acquiring or continuing in effect any additional insurance to protect the interests of the Contractor or its Related Parties.

32.4 Third Party Claims in Excess of Required Insurance

- (A) NASA has determined that launches, under this contract, are conducted by NASA in performance of its functions, as specified in 42 U.S.C. § 2473(a). As a result, once the Contractor or its insurers have paid out for Third Party claims the amount of required insurance under paragraph 32.3(B), NASA will consider any additional Third Party claims for damage to or loss of property

or personal injury or death arising from the launches as claims against the United States under the authority of 42 U.S.C. § 2473 (c)(13).

- (B) The Contractor (once it or its insurers have paid to Third Party claimants, from their own funds, an amount equal to the amount of required insurance for a Launch) shall adjust, settle and pay meritorious and reasonable additional Third Party claims in excess of the amount of required insurance. To the extent NASA determines that such costs exceed \$25,000, it will forward such claim to the Secretary of Treasury for certification and payment pursuant to 31 U.S.C. § 1304(a). Such costs are subject to the availability of funds and the usual tests for allowability and the total of such costs shall be paid up to a limit of \$1.5 billion above the insurance obtained by the Contractor for each launch.
- (C) In evaluating Third Party claims against the United States paid by the Contractor, NASA will consider such a claim to be meritorious unless the claim represents:
- (i) Liabilities for which the Contractor is otherwise responsible under the express terms or conditions of the contract or a task order issued under this contract
 - (ii) Liabilities for which the Contractor has failed to insure or to maintain insurance as required by the Contracting Officer
 - (iii) Liabilities for which the Contractor has not reasonably adjusted, settled, or paid on a meritorious and reasonable basis.
 - (iv) Liabilities that result from willful misconduct or lack of good faith on the part of any of the Contractor's directors, officers, managers, superintendents, or other representatives who have supervision or direction of:
 - (a) All or substantially all of the Contractor's business
 - (b) All or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed
 - (c) A separate and complete major industrial operation in connection with the performance of this contract
 - (v) Liabilities that arise from the willful misconduct or gross negligence of the Claimant or, in the case of a claim based on death, the claimant's descendant.

32.5 Third Party Liability for NASA Secondary Payloads on Non-NASA Primaries

The requirements of this clause 32.0 shall apply to all launch services provided under this contract except for those services involving NASA secondary payloads which are manifested on a launch service for non-NASA (commercial) primary payloads. In the event that a NASA secondary payload is manifested on a launch service for a non-NASA (commercial) primary payload, the contractor shall obtain third party liability insurance and indemnification for third party claims in excess of insurance pursuant to the Commercial Space Launch Act, 49 U.S.C. 70101 et seq.

33.0 FAR 52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS--COMMERCIAL ITEMS (MAR 2005) ALT I (APRIL 2002)

The Offeror Representations and Certifications (Attachment E1) as completed by the Contractor are hereby incorporated in their entirety by reference with the same force and effect as if they were given in full text.

34.0 FAR 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS (MAR 2004)

- (a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clause, which is incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items: 52.233-3, Protest after Award (Aug 1996) (31 U.S.C. 3553).
- (b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

- ☒ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (Jul 1995), with Alternate I (Oct 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).
- ☐ (2) 52.219-3, Notice of Total HUBZone Set-Aside (Jan 1999) (15 U.S.C. 657a).
- ☒ (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (Jan 1999) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

- ☐ (4)(i) 52.219-5, Very Small Business Set-Aside (June 2003) (Pub. L. 103-403, section 304, Small Business Reauthorization and Amendments Act of 1994).
- ☐ (ii) Alternate I (Mar 1999) of 52.219-5.
- ☐ (iii) Alternate II (June 2003) of 52.219-5.
- ☐ (5)(i) 52.219-6, Notice of Total Small Business Set-Aside (June 2003) (15 U.S.C. 644).
- ☐ (ii) Alternate I (Oct 1995) of 52.219-6.
- ☐ (iii) Alternate II (Mar 2004) of 52.219-6.
- ☐ (6)(i) 52.219-7, Notice of Partial Small Business Set-Aside (June 2003) (15 U.S.C. 644).
- ☐ (ii) Alternate I (Oct 1995) of 52.219-7.
- ☐ (iii) Alternate II (Mar 2004) of 52.219-7.
- ☒ (7) 52.219-8, Utilization of Small Business Concerns (Oct 2000) (15 U.S.C. 637(d)(2) and (3)).
- ☒ (8)(i) 52.219-9, Small Business Subcontracting Plan (Jan 2002) (15 U.S.C. 637(d)(4)).
- ☐ (ii) Alternate I (Oct 2001) of 52.219-9.
- ☒ (iii) Alternate II (Oct 2001) of 52.219-9.
- ☐ (9) 52.219-14, Limitations on Subcontracting (Dec 1996) (15 U.S.C. 637(a)(14)).
- ☐ (10)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (June 2003) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).
- ☐ (ii) Alternate I (June 2003) of 52.219-23.
- ☒ (11) 52.219-25, Small Disadvantaged Business Participation Program-Disadvantaged Status and Reporting (Oct 1999) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

- (12) 52.219-26, Small Disadvantaged Business Participation Program-Incentive Subcontracting (Oct 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- X (13) 52.222-3, Convict Labor (June 2003) (E.O. 11755).
- X (14) 52.222-19, Child Labor-Cooperation with Authorities and Remedies (Jan 2004) (E.O. 13126).
- X (15) 52.222-21, Prohibition of Segregated Facilities (Feb 1999).
- X (16) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).
- X (17) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212).
- X (18) 52.222-36, Affirmative Action for Workers with Disabilities (Jun 1998) (29 U.S.C. 793).
- (19) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212).
- (20)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Aug 2000) (42 U.S.C. 6962(c)(3)(A)(ii).
- (ii) Alternate I (Aug 2000) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)).
- X (21) 52.225-1, Buy American Act-Supplies (June 2003) (41 U.S.C. 10a-10d).
- (22)(i) 52.225-3, Buy American Act-Free Trade Agreements-Israeli Trade Act (Jan 2004) (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, Pub. L. 108-77, 108-78).
- (ii) Alternate I (Jan 2004) of 52.225-3.
- (iii) Alternate II (Jan 2004) of 52.225-3.
- X (23) 52.225-5, Trade Agreements (Jan 2004) (19 U.S.C. 2501, *et seq* ., 19 U.S.C. 3301 note).
- (24) 52.225-13, Restrictions on Certain Foreign Purchases (Oct 2003) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).
- (25) 52.225-15, Sanctioned European Union Country End Products (Feb 2000) (E.O. 12849).

- (26) 52.225-16, Sanctioned European Union Country Services (Feb 2000) (E.O. 12849).
- (27) 52.232-29, Terms for Financing of Purchases of Commercial Items (Feb 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- (28) 52.232-30, Installment Payments for Commercial Items (Oct 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- (29) 52.232-33, Payment by Electronic Funds Transfer-Central Contractor Registration (Oct 2003) (31 U.S.C. 3332).
- (30) 52.232-34, Payment by Electronic Funds Transfer-Other than Central Contractor Registration (May 1999) (31 U.S.C. 3332).
- (31) 52.232-36, Payment by Third Party (May 1999) (31 U.S.C. 3332).
- (32) 52.239-1, Privacy or Security Safeguards (Aug 1996) (5 U.S.C. 552a).
- (33)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Apr 2003) (46 U.S.C. Approx 1241 and 10 U.S.C. 2631).
- (ii) Alternate I (Apr 1984) of 52.247-64.
- (c) The Contractor shall comply with the FAR clauses in this paragraph, (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or executive orders applicable to acquisitions of commercial items or components:
 - (1) 52.222-41, Service Contract Act of 1965, as Amended (May 1989) (41 U.S.C. 351, *et seq*).
 - (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (May 1989) (29 U.S.C. 206 and 41 U.S.C. 351, *et seq*).
 - (3) 52.222-43, Fair Labor Standards Act and Service Contract Act-Price Adjustment (Multiple Year and Option Contracts) (May 1989) (29 U.S.C. 206 and 41 U.S.C. 351, *et seq*).
 - (4) 52.222-44, Fair Labor Standards Act and Service Contract Act-Price Adjustment (Feb 2002) (29 U.S.C. 206 and 41 U.S.C. 351, *et seq*).

- (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreements (CBA) (May 1989) (41 U.S.C. 351, *et seq.*).
- (d) *Comptroller General Examination of Record*. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records-Negotiation.
- (1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.
 - (2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.
 - (3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.
- (e) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) or (d) of this clause, the Contractor is not required to include any FAR clause, other than those listed below (and as may be required by an addenda to this paragraph to establish the reasonableness of prices under Part 15), in a subcontract for commercial items or commercial components--
- (1) 52.222-26, Equal Opportunity (E.O. 11246);
 - (2) 52.222-35, Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era (38 U.S.C. 4212);
 - (3) 52.222-36, Affirmative Action for Workers with Disabilities (29 U.S.C. 793); and

- (4) 52.247-64, Preference for Privately-Owned U.S. Flag Commercial Vessels (46 U.S.C. 1241) (flow down not required for subcontracts awarded beginning May 1, 1996).

35.0 KSC 52.214-90 DELIVERY INSTRUCTIONS FOR HAND-CARRIED BIDS/PROPOSALS (AUGUST 2005)

Delivery Address:

All hand-carried offers (bids or proposals) shall be delivered to the Central Industry Assistance Office (CIAO), 7110 N. Courtenay Parkway, Merritt Island, FL, 32953 on or before the date and time set for receipt of proposals or bids. The CIAO is located on State Road 3, approximately 2 miles south of Gate 2 to KSC. Access to KSC is not required.

Offerors are responsible for assuring that hand-carried bids are either received by NASA Government employees at the CIAO or dropped in the CIAO mail box located outside of the building.

Late Delivery of Offers/Bids

Late offers/bids will be processed in accordance with FAR 52.214-7, "Late Submissions, Modifications and Withdrawals of Bids," FAR 52.215-1, "Instructions to Offerors - Competitive Acquisition," FAR 52.212-1, "Instructions to Offerors - Commercial Items," or FAR 52.214-23, "Late Submissions, Modifications, and Withdrawals of Technical Proposals Under Two-Step Sealed Bidding," included in this solicitation.

36.0 LISTING OF CLAUSES INCORPORATED BY REFERENCE

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

36.1 FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

| | |
|--------------------|--|
| FAR 52.202-1 | Definitions (May 2001) |
| FAR 52.211-14 | Notice of Priority Rating for National Defense Use (Sep 1990) (DOC9) |
| FAR 52.215-1(c)(3) | Instructions to Offerors-Competitive Acquisition (Jan 2004) |
| FAR 52.222-1 | Notice to the Government of Labor Disputes (Feb 1997) |
| FAR 52.222-21 | Prohibition of Segregated Facilities (Feb 1999) |
| FAR 52.222-37 | Employment Reports On Disabled Veterans And Veterans of the Vietnam Era (Dec 2001) |
| FAR 52.232-18 | Availability of Funds (Apr 1984) |
| FAR 52.232-25 | Prompt Payment (Oct 2003) |

| | |
|---------------|---|
| FAR 52.232-29 | Terms for Financing of Purchases of Commercial Items (Feb 2002) |
| FAR 52.232-34 | Payment by Electronic Funds Transfer – Other than Central Contractor Registration (May 1999) Paragraph (b) <i>blank is completed with “no later than 15 days prior to submission of the first request for payment.”</i> |
| FAR 52.233-1 | Disputes (July 2002) |
| FAR 52.242-15 | Stop-Work Order (Aug 1989) |
| FAR 52.243-1 | Changes—Fixed-Price (Aug 1987) Alternate I (Apr 1984) |
| FAR 52.246-4 | Inspection of Services—Fixed-Price (Aug 1996) |
| FAR 52.246-25 | Limitation of Liability--Services (Feb 1997) |

36.2 NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES:

| | |
|-----------------|--|
| NFS 1852.204-76 | Security Requirements for unclassified Information Technology (IT) Resources (July 2000) |
| NFS 1852.215-84 | Ombudsman (Oct 2003) James E. Hattaway, Jr. at (321) 867-7246 |
| NFS 1852.219-74 | Use of Rural Area Small Businesses (Sep 1990) |
| NFS 1852.219-75 | Small, Small Disadvantaged, and Women-Owned Small Business Subcontracting Reporting (May 1999) |
| NFS 1852.219-76 | NASA 8 Percent Goal (Jul 1997) |
| NFS 1852.225-70 | Export Licenses (Feb 2000) Alternate I |
| NFS 1852.223-70 | Safety and Health (April 2002) |
| NFS 1852.223-75 | Major Breach of Safety or Security (July 2000) |
| NFS 1852.227-70 | New Technology (May 2002) |
| NFS 1852.228-78 | Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches (Sep 1993) |
| NFS 1852.228-75 | Minimum Insurance Coverage (Oct 1988) |
| NFS 1852.243-71 | Shared Savings (Mar 1997) |

36.3 KENNEDY SPACE CENTER STANDARD CLAUSES

| | |
|---------------|-------------------------------------|
| KSC 52.204-90 | Security Controls at KSC (Nov 2000) |
| KSC52.243-90 | Authorized Changes (Feb 1990) |

37.0 FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at these addresses:

<http://www.arnet.gov/far/>

GSA FAR Homepage

<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>

NASA FAR Supplement
Homepage

<http://www.ksc.nasa.gov/procurement/clause/>

KSC Index of Procurement
Clauses

38.0 FAR 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

The use in this solicitation or contract of any NASA FAR Supplement clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

39.0 SPECIAL UNDERSTANDING REGARDING DAMAGE TO GOVERNMENT PAYLOADS

Prior to intentional ignition of the launch vehicle on the launch pad, the Contractor shall not be responsible for damage to the spacecraft while the spacecraft is under the control of the Contractor, except when such damage is caused by the gross negligence, willful misconduct, or lack of good faith by the Contractor. In the event the Contractor is determined to be responsible for such damage, the Contractor shall reimburse the Government for the cost of spacecraft repairs as well as any costs associated with launch delays as set forth in the Section C, Clause 19.0, entitled "Adjustments to Launch Schedule." After intentional ignition, the provisions of Contract Section C, clause 24.0 shall apply.

Section E

SECTION E

SOLICITATION PROVISIONS

| | | |
|----------------------|--|-------------|
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|----------------------|--|-------------|

ATTACHMENT E1

REPRESENTATIONS AND CERTIFICATIONS

1.0 FAR 52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS-- COMMERCIAL ITEMS (MAR 2005) ALT I (APR 2002)

An offeror shall complete only paragraph (j) of this provision if the offeror has completed the annual representations and certificates electronically at <http://orca.bpn.gov> . If an offeror has not completed the annual representations and certifications electronically at the ORCA website, the offeror shall complete only paragraphs (b) through (i) of this provision.

(a) *Definitions.* As used in this provision:

"Emerging small business" means a small business concern whose size is no greater than 50 percent of the numerical size standard for the NAICS code designated.

"Forced or indentured child labor" means all work or service—

(1) Exacted from any person under the age of 18 under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily; or

(2) Performed by any person under the age of 18 pursuant to a contract the enforcement of which can be accomplished by process or penalties.

"Service-disabled veteran-owned small business concern"—

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) The TIN may be used by the government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.]

(3) *Taxpayer Identification Number (TIN).*

☒ **TIN:**

Ex. 4

☐ TIN has been applied for.

☐ TIN is not required because:

☐ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

☐ Offeror is an agency or instrumentality of a foreign government;

☐ Offeror is an agency or instrumentality of the Federal Government;

(4) *Type of organization.*

☐ Sole proprietorship;

☐ Partnership;

☒ **Corporate entity (not tax-exempt);**

☐ Corporate entity (tax-exempt);

☐ Government entity (Federal, State, or local);

☐ Foreign government;

☐ International organization per 26 CFR 1.6049-4;

☐ Other _____.

(5) *Common parent.*

☒ **Offeror is not owned or controlled by a common parent:**

☐ Name and TIN of common parent:

(8) Small Business Size for the Small Business Competitiveness Demonstration Program and for the Targeted Industry Categories under the Small Business Competitiveness Demonstration Program. *[Complete only if the offeror has represented itself to be a small business concern under the size standards for this solicitation.]*

(i) *[Complete only for solicitations indicated in an addendum as being set-aside for emerging small businesses in one of the designated industry groups (DIGs).]* The offeror represents as part of its offer that it ☒ is, ☐ is not an emerging small business.

(ii) *[Complete only for solicitations indicated in an addendum as being for one of the targeted industry categories (TICs) or designated industry groups (DIGs).]* Offeror represents as follows:

(A) Offeror's number of employees for the past 12 months (check the Employees column if size standard stated in the solicitation is expressed in terms of number of employees); or

(B) Offeror's average annual gross revenue for the last 3 fiscal years (check the Average Annual Gross Number of Revenues column if size standard stated in the solicitation is expressed in terms of annual receipts).

(Check one of the following):

| Number of Employees | Average Annual Gross Revenues |
|--------------------------------------|--|
| <input type="checkbox"/> 50 or fewer | <input type="checkbox"/> \$1 million or less |
| <input type="checkbox"/> 51-100 | <input type="checkbox"/> \$1,000,001-\$2 million |
| <input type="checkbox"/> 101-250 | <input type="checkbox"/> \$2,000,001-\$3.5 million |
| <input type="checkbox"/> 251-500 | <input type="checkbox"/> \$3,500,001-\$5 million |
| <input type="checkbox"/> 501-750 | <input type="checkbox"/> \$5,000,001-\$10 million |
| <input type="checkbox"/> 751-1,000 | <input type="checkbox"/> \$10,000,001-\$17 million |
| <input type="checkbox"/> Over 1,000 | <input type="checkbox"/> Over \$17 million |

(9) *[Complete only if the solicitation contains the clause at FAR 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns, or FAR 52.219-25, Small Disadvantaged Business Participation Program—Disadvantaged Status and Reporting, and the offeror desires a benefit based on its disadvantaged status.]*

paragraph (c)(10)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(11) (Complete if the offeror has represented itself as disadvantaged in paragraph (c)(4) or (c)(9) of this provision.) [The offeror shall check the category in which its ownership falls]:

☐ Black American.

☐ Hispanic American.

☐ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

☐ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory or the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

☐ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

☐ Individual/concern, other than one of the preceding.

(d) Representations required to implement provisions of Executive Order 11246 --

(1) Previous contracts and compliance. The offeror represents that --

(i) It ☒ has, ☐ has not, participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation; and

(ii) It ☒ has, ☐ has not, filed all required compliance reports.

(2) Affirmative Action Compliance. The offeror represents that --

(1) *Buy American Act -- Free Trade Agreements -- Israeli Trade Act Certificate.* (Applies only if the clause at FAR 52.225-3, Buy American Act -- Free Trade Agreements -- Israeli Trade Act, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(1)(ii) or (g)(1)(iii) of this provision, is a domestic end product and that the offeror has considered components of unknown origin to have been mined, produced, or manufactured outside the United States. The terms "component," "domestic end product," "end product," "foreign end product," and "United States" are defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act."

(ii) The offeror certifies that the following supplies are end products of Australia, Canada, Chile, Mexico, or Singapore or Israeli end products as defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act":

End Products of Australia, Canada, Chile, Mexico, or Singapore, or Israeli End Products:

| LINE ITEM NO. | COUNTRY OF ORIGIN |
|---------------|-------------------|
| | |
| | |
| | |

Table E1-B: End Products of Australia, Canada, Chile, Mexico, or Singapore, or Israeli End Products (Buy American Act-Free Trade Agreements-Israeli Trade Act) [*List as necessary*]

(iii) The offeror shall list those supplies that are foreign end products (other than those listed in paragraph (g)(1)(ii) or this provision) as defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act." The offeror shall list as other foreign end products those end products manufactured in the United States that do not qualify as domestic end products.

Other Foreign End Products:

| LINE ITEM NO. | COUNTRY OF ORIGIN |
|---------------|-------------------|
| | |
| | |
| | |

(4) *Trade Agreements Certificate*. (Applies only if the clause at FAR 52.225-5, Trade Agreements, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(4)(ii) of this provision, is a U.S.-made or designated country end product as defined in the clause of this solicitation entitled "Trade Agreements."

(ii) The offeror shall list as other end products those end products that are not U.S.-made or designated country end products.

Other End Products

| Line Item No.: | Country of Origin: |
|----------------|--------------------|
| | |
| | |
| | |

Table E1-E: Other End Products (Trade Agreements)
[List as necessary]

(iii) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25. For line items covered by the WTO GPA, the Government will evaluate offers of U.S.-made or designated country end products without regard to the restrictions of the Buy American Act. The Government will consider for award only offers of U.S.-made or designated country end products unless the Contracting Officer determines that there are no offers for such products or that the offers for such products are insufficient to fulfill the requirements of the solicitation.

(h) *Certification Regarding Debarment, Suspension or Ineligibility for Award (Executive Order 12549)*. (Applies only if the contract value is expected to exceed the simplified acquisition threshold.) The offeror certifies, to the best of its knowledge and belief, that the offeror and/or any of its principals--

(1) ☐ Are, ☒ **are not** presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; and

(2) ☐ Have, ☒ **have not**, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, state or local government contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft,

the ORCA database information, the offeror verifies by submission of this offer that the representation and certifications currently posted electronically at FAR 52.212-3, Offeror Representations and certifications—Commercial Items, have been entered or updated in the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201), except for paragraphs _____. *[Offeror to identify the applicable paragraphs at (b) through (i) of this provision that the offeror has completed for the purposes of this solicitation only, if any. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer. Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.]*

2.0 MINIMUM CONTRACT REQUIREMENT CERTIFICATIONS

2.1 Reserved

2.2 Certification Regarding United States Commercial Provider of Space Transportation Services (Public Law 105-303, Title II, Section 201)

- (A) Participation in this procurement is restricted to prime contractors from the United States launch vehicle/services industry meeting the definition of United States commercial provider.
- (B) The Offeror certifies, to the best of its knowledge and belief, that it ☒ is ☐ is not a United States commercial provider as defined below—
- (i) 'United States commercial provider' means a commercial provider, organized under the laws of the United States or of a State, which is—
- (a) more than 50 percent owned by United States nationals; or
- (b) a subsidiary of a foreign company and the Secretary of Transportation finds that—
- (1) such subsidiary has in the past evidenced a substantial commitment to the United States market through—
- (I) investments in the United States in long-term research, development, and manufacturing (including the manufacture of major components and subassemblies); and
- (II) significant contributions to employment in the United States; and

demonstrate its compliance with these criteria will not be considered for award.

- 2.3 The business entity(ies) actually performing the work specified in this contract shall be ISO 9001/2000 certified by a registrar accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB). The Offeror shall comply with this requirement by demonstrating that the corporation(s), corporate division(s), subsidiary(ies), joint venturer(s), partner(s), and/or any other business entity actually performing launch vehicle manufacture, payload/LV integration, testing, and launch activities is/are ISO 9001/2000 certified. A copy of the ISO Certification Certificate shall be provided to NASA.

Corporation Name: Space Exploration Technologies Corp.

ISO 9001/2000 Certificate
Number: 9Y281-1

Copy of ISO Certificate Attached: ☒ Yes

3.0 FAR 52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

- (a) *Definition.* "Women-owned business concern," as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.
- (b) *Representation.* [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, *Small Business Program representations, of this solicitation.*] The offeror represents that it ☐ is ☐ is not a women-owned business concern.

4.0 FAR 52.222-24 PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE EVALUATION (FEB 1999)

If a contract in the amount of \$10 million or more will result from this solicitation, the prospective Contractor and its known first-tier subcontractors with anticipated subcontracts of \$10 million or more shall be subject to a pre-award compliance evaluation by the Office of Federal Contract Compliance Programs (OFCCP), unless, within the preceding 24 months, OFCCP has conducted an evaluation and found the prospective Contractor and subcontractors to be in compliance with Executive Order 11246.

Attachment DI

EXhibit 1- F1

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STATEMENT OF WORK

1 Introduction

1.1 Scope

This Statement of Work (SOW) and all Exhibits and documents attached or referenced herein define the Government's requirements for the Contractor to provide launch services in support of NASA's Launch Services Program Office (LSPO). The scope of this contract effort includes up to and including risk Category 2 launch services capable of delivering, at a minimum, a 250kg payload to orbit at an altitude of 200 km and a launch inclination of 28.5°.

This SOW defines the overall launch service requirements for 'NASA or NASA-sponsored payloads' (hereinafter referred to as 'payloads'). The Contractor shall perform all tasks necessary to safely and reliably launch payloads in accordance with NASA-defined mission objectives. The Contractor shall support advance planning and perform analysis tasks as directed by the Contracting Officer.

It is the general contemplation of the parties to this contract that the Contractor shall have a broad mission in performing launch service related functions for the Government and designees. Therefore, the general scope of the contract covers any launch service and launch service related activities arising from the SOW in support of earth and space science exploration, and space station re-supply.

1.2 Objectives

The goal of the NASA Launch Services (NLS) contract is to provide the Agency with domestic launch services that are safe, successful, reliable, and affordable. The launch services will be provided at a fixed price. The contract will, to the maximum extent practical, incorporate best commercial practices.

The objectives of this contract are to:

- Ensure the safety of the public and all personnel, hardware, and property associated with the launch services.
- Provide affordable, accurate, and on-time delivery of LSPO manifested payloads to space.
- Provide a mechanism to incorporate new launch services, technology upgrades, improved systems engineering processes, and advances in manufacturing techniques.

- Provide risk mitigation while utilizing commercial practices.
- Provide flexible manifesting policy that recognizes the national priorities of NASA missions.
- Provide a capability to optimize cost, schedule, and performance to satisfy mission objectives.
- Provide for clear Government visibility into program schedule, technical performance, and risk.
- Foster competition and create opportunities for new, emerging launch service providers.
- Promote partnering among customers, launch service provider, and the LSPO program to maximize flexibility and responsiveness to customers needs.

1.3 Compliance Documents

The Contractor shall comply with the requirements contained in the following documents.

| Document No. | Revision | Document Title |
|---------------------|-------------------|--|
| EWR 127-1 | Dec 1999 | Eastern/Western Range, Range Safety Requirements ¹ (Required for VAFB or CCAFS launches only) |
| ISO 9001/2000-2000 | | International Organization of Standardization |
| KHB 1710.2 | E-1 April 2002 | KSC Safety Practices Handbook ^{2,3} |
| NPD 8710.3 | B, April 2004 | NASA Policy For Limiting Orbital Debris |
| NASA-STD-8719.9 | May 2002 | NASA Safety Standard for Lifting Devices and Equipment ² |

¹ Any agreements between the Contractor and the Range for a tailored EWR 127-1 are acceptable to NASA.

² The Contractor shall comply with the latest revisions of KHB 1710.2E and NASA-STD-8719.9 for processes performed in NASA facilities.

- ³ Any agreement between the Contractor and NASA for a tailored KHB 1710.2 are acceptable.

1.4 Definitions

Mission Specific: all standard, non-standard, and mission unique services provided to meet the requirements of the payload and mission.

Mission Unique: services provided that are newly performed or developed to meet mission requirements and that are not included in the standard and non-standard services. Typically these pertain to first flight items.

2 Standard Launch Service

The Contractor shall perform all launch service tasks necessary to deliver payloads to defined orbital parameters in compliance with mission requirements. The launch service shall support missions to all orbital parameters, consistent with vehicle configuration capabilities and launch Range restrictions. The Contractor shall provide launch services, which are in compliance with all Range requirements. The Contractor shall make all arrangements with the responsible authorities for the required launch Range authorization and support for vehicle processing; integrated payload/vehicle processing, launch; and launch site maintenance and modifications. NASA reserves the right to approve the choice of launch site [e.g. Cape Canaveral Air Force Station (CCAFS), Vandenberg Air Force Base (VAFB), Reagan Test Site (RTS)].

The Contractor shall furnish all services, maintain all equipment and infrastructure including, but not limited to: program management, mission integration, launch site support, ground and flight system safety, and performance assurance, necessary to accomplish the safe and successful launch of payloads to the required orbit conditions within required launch periods. The Contractor shall provide facilities and services at Contractor facilities for NASA personnel performing insight and approval functions during the performance of the contract. The Contractor shall provide access to launch vehicle documentation in support of NASA insight and approval functions.

The Contractor shall provide all necessary services, test hardware and software, and mission specific elements required to integrate the payload(s) to the launch vehicle systems. The Contractor shall meet all launch service performance requirements described in Exhibit 1, Capabilities, Specifications and Environments. All capabilities and conditions stated in Exhibit 1 must be consistent and compatible with all other capabilities and conditions stated in Exhibit 1 and in response to the requirements of the SOW. Any exceptions to the stated capabilities or conditions must be specifically noted.

The Contractor shall coordinate with NASA Public Affairs Office all press releases concerning launches under this contract. During vehicle build-up, payload integration, and launch countdown, the Contractor shall allow NASA Public Affairs access to facilities to photograph and videotape activities, including hazardous operations. The Contractor shall assist NASA Public Affairs in developing the launch commentary for NASA Television by furnishing launch countdown and operations background material. The Contractor may also be asked to provide information to support the development of the press kit document and the NASA pre-launch and post-launch news conferences. The Contractor shall coordinate with NASA Public Affairs Protocol and Guest Services a minimum of sixty (60) days in advance of each launch to determine any special requirements.

The Contractor shall provide standard launch services as delineated in Exhibit 2, Standard Services List. All hardware, software, analyses, and support required to provide each item listed in Exhibit 2, shall be included in the standard launch service.

All Data Requirements List (DRL) and Supplemental Data List (SDL) items, identified in Attachment D2 and D3 respectively, shall be included in the standard launch service.

2.1 Launch Vehicle (LV)

The standard launch service shall include, as a minimum, the following:

(A) Launch timing capabilities with

- (i) Launch periods (campaign) as small as 14 days in duration**
- (ii) Multiple approximately 24 hour re-launch attempts in the event of a launch scrub**
- (iii) Instantaneous launch window**
- (iv) Simultaneous planetary launch campaigns, with launches separated by 30 days**
- (vi) Trajectory targeting at multiple flight azimuths on any one day of the launch period**

- (B) A launch vehicle and Payload Adapter (PA) with appropriate electrical and mechanical interfaces (as described in Exhibit 1) required for payload integration and testing.
- (C) A payload separation system with the following characteristics:
 - (i) The payload shall be protected from debris generated by the separation system.
 - (ii) The separation system shall function in a manner that prevents any re-contact with the payload, including Contractor-provided attach hardware on the payload, by the upper stage or any element of the separation system once separation has been initiated.
 - (iii) Redundant payload separation indications.

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2.2 Program Management

The Contractor shall provide all program management functions required to provide the launch services and to satisfy the mission requirements for each NASA mission. The program management function of this contract shall provide insight to NASA for all technical and programmatic activities performed under this contract.

The Contractor shall coordinate all program management functions and issues directly with the KSC LSPO designated representative(s). The NASA Contracting Officer is the only NASA representative authorized to provide formal contract direction.

2.2.1 Formal Reviews

The Contractor shall conduct program reviews, design reviews, and readiness reviews, and shall provide for the participation of NNC. The Contractor shall provide minutes and action items resulting from each review to NASA within one week after the review. A copy of the presentation material shall be available at the review for all NNC attendees (DRD C1-1).

2.2.1.1 Program Reviews

During the contract performance period, the Contractor shall conduct Program Reviews with NASA at least once per year to: report development and production status, ensure schedules support program objectives, review action items, review program schedules, and discuss any issues. The intent of the program review is to provide a forum for open dialog between NASA and the Contractor with respect to launch services. NASA will provide status of Agency direction at the reviews. The review location shall alternate between NASA and Contractor facilities unless mutually agreed upon to do otherwise.

2.2.1.2 Design Reviews – Mission Unique

The Contractor shall conduct and chair/co-chair design reviews, as described below, that apply to the system, subsystem, component, and software level for all first flight mission unique items. Where there is not a direct match between a SOW specified mission unique design review(s) and the Contractor's standard review(s), the Contractor's review process will be acceptable provided it addresses equivalent content. For items previously flown, the following design reviews will not be required, provided the Contractor allows insight into design and prior performance of each item.

(A) Mission Unique Requirements Review (MURR)

The Contractor shall conduct a MURR prior to the Mission Unique Preliminary Design Review (MUPDR) with NNC to review the mission unique design requirements for the following items:

- (i) System requirements' identification and definition to a level adequate to verify launch vehicle performance capabilities.
- (ii) Design restrictions, limitations, and known violations.
- (iii) Physical and mechanical interfaces (e.g., payload to launch vehicle, payload envelope, and access provisions).

- (iv) Electrical interfaces (e.g., launch vehicle to payload, payload to umbilical, interfaces with electrical ground support equipment, pad electrical systems, ground batteries, telemetry, grounding, and power).
- (v) Functional interfaces (e.g., structures, structural loads, and vibration).
- (vi) Avionics systems and interfaces (e.g., payload avionics interfaces with launch vehicle, separation systems, telemetry interfaces, payload command and telemetry, and RF).
- (vii) Mass properties.
- (viii) Environmental requirements (e.g., thermal, contamination, vibration, pressure, Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC), shock, launch complex RF, and lightning).
- (ix) Orbital requirements, launch vehicle performance, launch window injection, and deployment attitudes and rates.
- (x) Payload/Launch Vehicle (LV) separation requirements (e.g., separation conditions, launch vehicle post-separation maneuver requirements, and telemetry).

(B) Mission Unique Preliminary Design Review (MUPDR)

The Contractor shall conduct a preliminary detailed design review prior to major commitment to drawings and design. Mission unique trade studies shall be completed prior to the MUPDR. The Contractor shall discuss analyses performed and their results along with comparisons to any similar proven designs. The Contractor shall evaluate the safety of the design and its ability to meet safety requirements. The preliminary design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUPDR:

- (i) All system requirements have been allocated to the subsystem and component level and the flow down is adequate to verify system performance.
- (ii) The design solutions being proposed are expected to meet the performance and functional requirements.
- (iii) The design does not pose major problems that may cause schedule delays.

- (iv) Overall system architecture has been established and all launch vehicle to payload interfaces have been identified and are verifiable.
- (v) The design solution can be produced based on existing processes and techniques; if not, risk areas, which require unique and unproved processes, are identified and risk mitigation plans are established.
- (vi) An acceptable operations concept has been developed.
- (vii) Preliminary LV interfaces have been defined.
- (viii) Preliminary plans are established for end-to-end testing methodologies.
- (ix) 30% drawings released.

(C) Mission Unique Critical Design Review (MUCDR)

The Contractor shall conduct a MUCDR prior to design freeze and before significant fabrication activity begins. The Contractor shall present a final detailed design using drawings, analyses, and evaluation testing that shows the design meets final performance and interface specifications, safety requirements, and mission objectives. The Contractor shall provide selection criteria for the evaluation tests performed to prove validity. The critical design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUCDR:

- (i) All technical problems and design anomalies have been resolved without compromising system performance, reliability and safety.
- (ii) The detailed design will meet performance, functional requirements, and schedule.
- (iii) Software simulations and prototyping results do not present any potential mission risks.
- (iv) All key subsystem and/or component engineering analyses are complete.
- (v) Integrated safety analysis identifying any remaining hazards and proposed resolution.
- (vi) Launch vehicle/payload compatibility test plans have been defined.
- (vii) 90% drawings released.

2.2.1.3 Readiness Reviews

The Pre-Mate Readiness Review, Launch Management Coordination Meeting (LMCM), Launch Readiness Review (LRR), and Flight Readiness Review (FRR) described herein will be conducted for each NASA mission.

(A) Pre-Mate Readiness Review

The Contractor shall conduct a Pre-Mate Readiness Review to demonstrate the launch site and launch vehicle are ready for payload mechanical and electrical integration. The Contractor shall conduct an LV/site walk-down [reference SOW Section 2.4.1.1(D)] with NNC participation prior to or in conjunction with the Pre-Mate Readiness Review. The Contractor shall present as a minimum:

- (i) Action item status, safety status, payload mating plan, closure plan, payload integration/launch site documentation, interface verifications, checkout and launch software status, nonconformance reports, launch site status, and review of flight profile.
- (ii) A detailed schedule showing all activities remaining to achieve an on-time launch.

(B) Launch Management Coordination Meeting (LMCM)

The Contractor shall participate in an LMCM conducted by NASA before each launch dress rehearsal or launch. The LMCM is used to ensure the readiness of the launch team to execute the procedures necessary to conduct the launch dress rehearsal (reference SOW Section 2.4.1.3) or launch. At this meeting, participant roles and responsibilities during countdown shall be identified. The Contractor shall develop and present a decision matrix for its launch team which defines who has authority to issue a GO, NO GO, and HOLD during launch countdown. The Contractor shall describe its launch day management activities, identify key team members, and define responsibilities and communications between the launch vehicle, NASA, and payload teams.

(C) Launch Readiness Review (LRR)

NASA will conduct/chair, and the Contractor shall participate in an LRR for each mission to ensure the specific launch vehicle is acceptable for flight and all Range and other mission requirements have been met, or will be satisfied prior to launch. The LRR is held approximately three days before launch. As a minimum, the Contractor shall provide verification that:

- (i) All critical items required to proceed into final launch countdown are ready.

- (ii) Vehicle configuration is defined and all vehicle systems have been verified per launch site test plans.
- (iia) Updated final mission analysis (performed with final mass properties) has not significantly changed the mission plan
- (iii) All previously recorded action items have been closed or are reflected on the schedule.
- (iv) All previously held Contractor's readiness review actions have been closed or resolved.
- (v) Launch site/Range support organizations have committed to launch.
- (vi) Tracking and data support resources are committed to launch.
- (vii) Any open work is identified and closeout plans and schedules are in place and supportable.
- (viii) Any constraints to launch are identified and resolution plans developed.
- (ix) Mission risks are known and documented.
- (x) Launch commit criteria for payload and launch vehicle is approved and released.

The Contractor shall also discuss:

- (i) Anomalies from previous missions, including non-NASA missions
- (ii) Hardware/software failures in the field either on our vehicle or in the fleet
- (iii) Open corrective actions/problems reports
- (iv) First flight items

(D) Flight Readiness Review (FRR)

NASA will conduct/chair, and the Contractor shall participate in an FRR one day prior to launch to verify all actions from the LRR are complete and final processing has been successfully completed. NASA will appoint the chairperson for this review. At the conclusion of this review, an "approval to proceed with launch countdown" is given. Representatives from the Contractor, Range, and NNC agencies sign the Certificate of Flight

Readiness. The Contractor shall prepare the Certificate of Flight Readiness. A sample Certificate of Flight Readiness is provided in Exhibit 4.

2.2.2 Risk Management

The Contractor shall implement risk management techniques that address the identification, analysis, mitigation, and tracking of potential impacts to mission success. The Contractor shall develop the criteria, methods, and procedures used for identifying critical items.

2.2.3 Configuration Management

The Contractor shall perform configuration management of the launch vehicle design and production for all launch vehicle components/subsystems, hardware, and software.

2.2.4 Manifest Policy

The Contractor shall develop a manifest policy that addresses the Contractor's overall approach to ensuring timely launch of payloads. The Contractor shall provide a five-year planning manifest to the Government (DRD C1-4) to support Government mission scheduling.

2.2.5 New Launch Vehicle Orientation

At the initiation of a new launch service the Contractor shall support an orientation briefing at KSC. This briefing shall introduce Contractor personnel and establish project interfaces with NASA personnel and describe the Contractor's organization and infrastructure. The briefing shall contain information summarizing the design, performance, fabrication, integration, testing, qualification and operational features of the launch vehicle systems and supporting facilities required to provide the launch service in the form of diagrams, schematics, pictures, drawings, videos, etc.

2.3 Mission Integration Services

2.3.1 Mission Integration Management

The Contractor shall be responsible for managing the mission integration of the payload flight and ground systems with the launch vehicle and its associated GSE. In accordance with this responsibility, the Contractor shall perform, as a minimum, the following services:

- (A) Provide a single point of contact with overall mission responsibility for each mission. This single point of contact shall be responsible for coordinating support from all technical disciplines and management during the integration process.
- (B) Conduct mission integration meetings (kick-off, working group, technical interchange) approximately quarterly from L-27 months to launch
- (C) Provide a co-chairperson along with NASA for all working groups and technical interchange meetings. The Contractor co-chairperson shall be responsible for preparing and distributing agendas, minutes and action item logs for each meeting. The Contractor shall maintain the action item database and ensure closure of all actions.
- (D) Provide appropriate technical/engineering representation at payload preliminary and critical design reviews.
- (E) Plan, schedule, and manage mission analyses required to define and verify compatibility of the payload with the interface requirements and environments (reference Table D1-A, SOW paragraph 2.3.2).
- (F) Track development status of and resolve issues associated with mission specific hardware and software.
- (G) Coordinate interface and support requirements for the mission.
- (H) Plan/coordinate mission specific flight operations.
- (I) Manage integration activities at the launch site.
- (J) Manage and coordinate the launch vehicle safety approval process.
- (K) Prepare, maintain and implement a payload to launch vehicle ICD for each mission. Implement the ICD verification matrix. The ICD shall include all mission requirements including LV and launch site interface definition and environments. The ICD shall include the payload to LV/launch site electrical and mechanical interface drawings (DRD C2-1).
- (L) Manage the design, development, qualification, testing and integration of mission unique requirements.
- (M) Evaluate the capability of the launch vehicle and define any performance and payload volume the Contractor may make available to NASA for secondary payloads.

- (N) Provide mission status to NNC throughout the launch campaign from Authority to Proceed (ATP) through mission success determination.

2.3.2 Mission Analyses

All vehicles provided under this contract shall include the following analysis for each mission as part of the standard launch service. The Contractor shall prepare and submit the standard mission analyses as listed in Table D1-A.

Ex. 4

The standard launch service shall include all analyses required to demonstrate compliance with NPD 8710.3, NASA Policy for Limiting Orbital Debris.

2.3.3 Mission Success Determination

Mission success will be based on the criteria set forth in Section C, paragraph 24.1, Mission Success Criteria. Mission success determination requirements are detailed in Section C, paragraph 24.2, Mission Success Determination.

The Contractor shall prepare and submit a Quick Look Flight Report (DRD C4-12) and a Final Flight Report (DRD C4-13). Within fifteen (15) days of receipt of the Final Flight Report, the Contracting Officer will either determine the launch

a Mission Success or inform the Contractor of the Government's intent to withhold determination for payload evaluation.

2.4 Launch Site Support

2.4.1 Pre-Launch Checkout and Launch Support

2.4.1.1 Launch Vehicle Preparation and Launch

For launch services provided under this contract, the Contractor shall, as a minimum;

- (A) Perform all LV preparations and launch site operations necessary to safely and successfully deliver the payload to the desired orbit.
- (B) Generate the required documents and obtain all required safety approvals for the LV System and integrated payload/launch vehicle system operations including payload/LV system integration and launch operations.
- (C) Provide NASA access to all meetings including, but not limited to, scheduling meetings, test briefings, and technical meetings. Upon request, the Contractor shall provide copies of schedules, test briefings, and other material presented at technical meetings.
- (D) Conduct LV/launch site walk-downs with NNC participation.

2.4.1.2 Telemetry Data and Launch Countdown Support

2.4.1.2.1 Baseline Vehicle Support

The Contractor shall provide, in electronic and hard copy form, all raw LV telemetry (RF and hardwire) formats used in sufficient detail to allow NASA to process and verify the data (DRD C6-1). This shall include a detailed listing and description of all measurements and calibration coefficients for all LV telemetry (TM) links including the guidance system.

Upon NASA request, the Contractor shall provide NASA with a test tape representative of the telemetry (RF and hardwire) signals of the launch vehicle and GSE sufficiently prior to the initial power-up test on each mission to allow NASA to verify its ability to process the Contractor's telemetry (SDL S6-1). Upon NASA request, the Contractor shall submit an end-to-end link test plan (SDL S6-2). The Contractor shall ensure proper operation of all LV telemetry links (RF and hardwire), voice communication channels, and video to the NASA ground

telemetry station prior to baseline launch vehicle processing. Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all significant vehicle test data (SDL S6-3). Upon NASA request, the Contractor shall provide real-time LV telemetry (RF and hardwire) data to NASA's ground telemetry station(s). Examples include, but are not limited to telemetry test data during initial vehicle power application, flight simulation prior to payload mate, and flight simulation following payload mate.

2.4.1.2.2 Integrated Support

Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all integrated test data (SDL S6-3). Upon NASA request, the Contractor shall provide real time integrated test telemetry (RF and hardwire) data to NASA's ground telemetry station(s).

Ex4

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2.4.1.3 Launch Dress Rehearsal

The Contractor shall conduct a minimum of one Dress Rehearsal prior to launch. The rehearsal shall exercise the launch countdown procedure, and will have the participation of the NNC and LV Contractor launch teams. The rehearsal may use an abbreviated countdown script with simulated payload/vehicle conditions, including anomalies.

2.4.2 Launch Site Payload Support

2.4.2.1 Payload Processing Facility

For launches conducted from CCAFS and VAFB, NASA will provide the Payload Processing Facility (PPF) unless processing services are purchased as a non-standard service. In the event the Contractor proposes and NASA approves an alternate launch site, the Contractor shall be responsible for providing a PPF, subject to NASA approval, meeting the payload requirements.

2.4.2.2 Launch Site Payload Integration Support

The Contractor shall provide all services, equipment, and support required for the integration and launch of each payload. Services shall include, as a minimum, the following:

- (A) Encapsulation of the payload complement at the PPF, for either flight or transport to the launch complex, mate with the LV and performance of integrated checkout activities.
- (B) Verification of the end-to-end functionality of the umbilical lines provided for payload use.
- (C) Support for the installation and checkout of the payload GSE (provided by the payload customer) at the launch site, and payload communication accommodations from the pad to the PPF. The Contractor shall also provide for a payload safety console at the Contractor's launch control center.
- (D) Provision of the mountings for, and the installation of, the payload GSE (provided by the payload customer) at the launch complex and/or remote sites.
- (E) Provision for contingency off-loading of payload propellants in accordance with the appropriate Range Safety requirements and appropriate payload procedures.
- (F) Provision for launch site services to meet payload requirements such as: power, air conditioning, GN₂/GHe purges, and contamination control.
- (G) Support of all activities required to de-mate and to return the payload to the processing facility if necessary.
- (H) Preparation of the procedures for integrated LV/payload operations for NASA approval and incorporation of the payload procedures as appropriate (DRD C5-5).

- (I) Coordination of payload and LV operations into an integrated operational flow, preparation of the schedules, and provision of the schedules with updates as needed to NNC.
- (J) Provision of contamination control for payloads while they are in the possession of the Contractor, or in a Contractor-provided PPF per the SOW, paragraph 2.4.2.3.
- (K) Provision of a payload protective cover for use after payload mate to the LV, if the fairing is installed at the launch pad. The cover shall be purged with conditioned air meeting the minimum requirements stated in the SOW, paragraph 2.4.2.3(C). Provisions shall be made for payload personnel ingress and egress.
- (L) Certification of payload contamination control requirements for: fairing surface cleanliness, cleanroom environments, and purge system cleanliness.
- (M) Support for the installation of customer provided RF re-radiating equipment.
- (N) Provision for the planning and execution of activities associated with the integrated testing of the customer's payload with the LV on the launch pad.

2.4.2.3 Contamination and Environmental Control

The Contractor shall provide and implement a generic payload contamination control plan and, if required, provide and implement a contamination control implementation plan for each payload. Using MIL-STD-1246C, MIL-PRF-27401D, FED-STD-209E, and NASA RP-1124 (Rev-4) as guidelines, the launch service shall meet the following minimum requirements:

- (A) Payload/Vehicle Integration Environment. For all Contractor provided facilities where the payload resides and is exposed (including payload processing facilities, integration facilities, or facilities at the launch pad), a Class 100,000 clean room environment per FED-STD-209E shall be provided. In addition, the environment shall be maintained within a temperature and humidity range of 16 to 27°C (60 to 80°F) and 30% to 60%, respectively. This environment shall be maintained at all times unless the payload is encapsulated within a transportation container or payload fairing and purge air has been established per 2.4.2.3(B) or (C), herein. If the Contractor provides a payload protective cover as identified in paragraph 2.4.2.2(K) of the SOW, and purge air has been established, the facility environment may be exceeded. Prior to removal of the payload protective cover, the facility shall be returned to a Class 100,000 clean room environment. The Contractor shall provide contamination and environmental monitoring when the payload is exposed.

Ex. 4

- (D) Fairing Internal Surface Cleaning. The internal surfaces of the payload fairing shall be cleaned, certified, and maintained to MIL-STD-1246C Level 750A, or better.
- (E) Clean Room Garments. Personnel garments used, at a contractor facility, in the integration of the payload shall be provided and cleaned by the Contractor. Personnel garments used in the integration of the payload shall comply with accepted clean room and personnel safety operating standards as specified in the mission specific contamination control plan.
- (F) Materials. All materials used in areas in close proximity to the payload shall be selected based on NASA RP-1124 (Rev-4). Materials shall have a Total Mass Loss (TML) of less than 1.0% and Collected Volatile Condensable Materials (CVCM) of less than 0.10%, or be expressly identified and submitted to NASA for approval.

2.4.2.4 Operational Support Services

The Contractor shall provide safety training, instruction, and certification for all Contractor-operated or provided integration facilities and launch sites to ensure users are aware of facility, launch site, launch vehicle and payload hazards and have adequate knowledge to carry out their tasks unescorted in a safe manner. The Contractor shall provide access for payload personnel to the payload/LV or storage facilities to accommodate payload customer requirements. The Contractor shall provide security to meet the requirements for payload or personnel protection.

2.4.3 Range Support and Services

Launch vehicles provided under this contract shall include all hardware, software, analysis and support necessary to meet the requirements of EWR 127-1, Eastern/Western Range Safety Requirements.

As part of the launch service, the Contractor shall make all launch Range support arrangements for: scheduling Range for launch and integrated testing, Range Safety functions, communications and timing, metric C-band beacon (radar) coverage, telemetry coverage, camera coverage of launch, and tracking and telemetry station acquisition predictions. If required, NASA will provide down range telemetry aircraft, Tracking and Data Relay Satellite System (TDRSS) and/or NASA owned ground station support for tracking and data recovery. The Contractor shall be responsible for coordinating and ensuring all tracking and data recovery support meets mission requirements (DRDs C2-3 and C2-4).

The Contractor shall make arrangements for Range provided services necessary to support the launch service. As a minimum, the following services are to be provided: fluids, gases, propellants, ordnance storage, facility usage, equipment support, shop and laboratory services, meteorology, base security, fire protection and environmental health.

The mission specific Program Requirements Document/Operational Requirements (PRD/OR)(DRD C2-2), or equivalent mission specific Range support documentation, shall be submitted to obtain Range support. The Contractor, with support from NASA, shall complete all forms pertinent to the mission and submit them to the appropriate Range for formal acceptance.

2.5 Safety, Reliability, and Quality Assurance

During the period of performance the Contractor shall establish, implement, and maintain comprehensive safety and health, reliability and quality assurance programs covering program management, mission integration management, and the design, development, production, test, integration and launch of the LVS.

2.5.1 Safety and Health Program

The Contractor shall provide a Safety and Health Plan that will implement safety requirements consistent with federal, state, and local government regulations and applicable NASA and Range Safety and Health requirements. This Plan shall describe the Safety organization including structure of management interfaces. Methods employed to ensure compliance with applicable safety requirements shall be identified in accordance with EWR 127-1. When the contractor is performing work in any NASA owned or operated facility (e.g., buildings 836 and 1610 at VAFB, SAEF-2 and PHSF at KSC), all NASA requirements and documentation as contained in the SOW, paragraph 1.3, Compliance Documents, shall be adhered. Each Contractor employee on NASA property, or custodian of NASA assets elsewhere, is responsible for reporting mishaps (DRD C3-2). The Contractor shall make provisions for NASA safety representative insight into integrated Payload/LV processing.

The Contractor shall implement a system safety program, which identifies and controls system/subsystem hazards that affect personnel, flight hardware and facilities.

2.5.2 Reliability Program

The Contractor shall implement and maintain a Reliability Program with an overall vehicle design reliability of no less than 95% at an 80% confidence factor. The Contractor's program shall facilitate evaluation of the Contractor and subcontractor's programs to determine if the product meets the overall design reliability requirements. Overall vehicle reliability predictions shall be incrementally revised to reflect design modifications.

2.5.3 Quality Assurance Program

The Contractor shall maintain a quality management system that is ISO 9001/2000 third party certified. The Registrar shall be accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB). In the event the Contractor certification is revoked, NASA shall be notified within 5 business days (DRD C3-3).

The Contractor shall maintain a Software Assurance Program using ISO 9001/2000-3 as a guideline.

The Contractor shall accommodate NASA participation in Contractor and subcontractor ISO audits. NASA insight will consist of monitoring audits with the Contractor's auditors and inspectors in order to provide understanding of the Contractor's quality system and insight of their processes.

The Contractor shall support NASA performance of ISO 2nd party audits, as required. The audits will be performed in accordance with ISO 10011 requirements. The Contractor shall provide a current Audit Plan and schedule for in-house and sub-Contractor audits upon request from NASA (C3-4). The Contractor shall provide a copy of both the Contractor performed internal Quality Audit Report and the subcontractor/vendor Quality Audit Reports (C3-5), when requested by NASA.

The Contractor shall provide for NASA attendance at any flight hardware reviews the Contractor performs at Contractor or subcontractor facilities. The Contractor shall make available to NASA any build paper, test results, nonconformance reports, discrepancy history, statistical process control, and failure analyses that are relevant to the reviews.

The Contractor shall provide read-only quality information to NASA (via remote terminal) from such Quality Assurance on-line database systems as exist and to which the Contractor has regular and timely input. An example is an on-line Problem/Failure Reporting (P/FR) system.

The contractor shall provide NASA all anomaly resolutions that affect the integrated payload/launch vehicle assembly, including both hardware and software. NASA will approve all integrated payload/launch vehicle anomaly resolutions. The contractor shall provide insight to Material Review Board (MRB) and failure reporting for all criticality 1 anomalies.

The Contractor shall participate in the Government/Industry Data Exchange Program (GIDEP) and provide Alert System Documentation (DRD C3-1).

2.6 NASA Insight and Approval

The Contractor shall comply with the Government's implementation of NPD 8610.23 and NPD 8610.24 as defined under Section C, Clause 25.0 and the SOW paragraph 2.2.1, Formal Reviews. As part of the standard launch service, the Contractor shall provide the data, documentation, drawings, analytical models, and support services as necessary to accommodate the requirements specified under contract Section C, Clause 25.0, Government Insight and Approval.

The Contractor shall notify NASA of qualification or test anomalies involving similar launch vehicles, systems, subassemblies and components. The Contractor shall make available to NASA all problem reports or discrepancy reports on LV systems' failures and anomalies. This shall include insight into fleet-wide problems, anomalies, MRB actions, deviations or waivers to systems, subsystems, materials, processes, and test equipment including those used on non-NASA missions.

In the event of an anomaly or launch failure, the Contractor shall support NASA's Failure Review Board, if activated, or shall allow NASA to fully participate in the Contractor's Failure Investigation Board including those for non-NASA missions.

NASA may elect to have representation as a resident office at the Contractor's major manufacturing and engineering facilities for the life of the contract. The Contractor shall provide accommodations and services, such as badging, furniture, telephones, and use of easily accessible fax, viewgraph, and copy machines from one to three residents and up to four visitors. A minimum of two voice and two data phone lines shall be provided. Electronic data transfer compatibility between the resident office and off-site NASA institutions is required. A 'Resident Office' will not be required at CCAFS or VAFB, but NASA will require operational support accommodations (i.e. office space, power, phone, communication boxes for monitoring vehicle testing, etc.) at the launch complex during NASA launch operations.

3 Non-Standard Services

The Contractor shall provide the non-standard services identified in Exhibit 3 as directed by the Contracting Officer. Implementation of all non-standard services shall be fully compliant with this SOW.

4 Mission Unique Requirements

The Contractor shall provide the mission unique services identified in Exhibit 5 as directed by the Contracting Officer. Implementation of all mission unique services shall be fully compliant with this SOW.

4.1 Mission Unique Hardware

The Contractor shall design, manufacture, test, and qualify for flight the mission unique hardware that is required to support the payload and mission. The Contractor shall prepare and submit drawings (DRD C5-4), test plans (DRD C5-2), and test reports (DRD C5-3) to support NASA insight and approval of mission unique hardware.

For vehicle changes initiated by the Contractor that are not fleet-wide changes, the Contractor shall prepare and submit a vehicle data package (DRD C5-1).

The Contractor shall use MIL-STD-1540 B or C as a guideline when developing environmental qualification and acceptance criteria and related test and analysis. Factors of safety for mission unique hardware shall meet the requirements of Table D1-B.

| Application | Test | | Analysis (No Test) | |
|---------------|-------|----------|--------------------|----------|
| | Yield | Ultimate | Yield | Ultimate |
| Non-Man Rated | 1.10 | 1.25 | 1.65 | 1.90 |

Table D1-B: Mission Unique Hardware Factors of Safety

4.2 Mission Unique Software

The Contractor shall provide source code and mission constants' listings (DRD C4-11) with appropriate requirement specifications to support NASA approval of mission unique software. The Contractor shall prepare and submit a pre-flight control system and stability analysis report (DRD C4-6) for the vehicle and mission unique software used for each mission.

4.3 Unanticipated Mission Unique Services

At the time of contract award, the Government may not have identified all mission unique services required for each mission. As unanticipated mission unique services are identified, the Contracting Officer will authorize the Contractor, in accordance with FAR 52.243-1, Changes – Fixed Price Alt I, to perform these services. In performing unanticipated mission unique services, the Contractor shall design the necessary ground and flight hardware/software; conduct appropriate design reviews; and manufacture, test and qualify for flight LV mission unique hardware/software, i.e., other than that provided as a standard service (Exhibit 2) or described in the non-standard services list (Exhibit 3).

5 SPECIAL TASK ASSIGNMENTS

The Contractor shall be required to perform special studies and analyses, provide materials, or fabricate hardware in support of this contract. Each task will be initiated by written direction from the NASA Contracting Officer. These tasks generally include: advance planning and feasibility studies in support of future contemplated missions; analyses in support of change requirements to authorized missions; development, fabrication, and test of hardware/software to support planning studies or special tests; mission unique studies; material provision; and hardware fabrication in support of potential missions prior to mission authorization.

6 INFORMATION TECHNOLOGY SECURITY

The contractor shall comply with NPG 2810.1, NASA's Security on Information Technology Guideline. Existing systems retained by the contractor, shall be brought into compliance within six months of the contract start date. New

systems shall be compliant prior to authorization to process. The contractor shall develop, update and implement an IT Security Plan (DR-46). NASA IT Security personnel will perform the penetration testing requirements of NASA STD NPG 2810.1 section 4.6 per KDP-KSC-P-1334.

7 GUIDELINE DOCUMENTS

The following documents are to be used as guidelines to the extent specified in this SOW.

| Document No | Rev. | Document Title |
|---------------------------|-------------------|---|
| AFSPCI 10-1213 | 6/1/2004 | Spacelift Launch Strategy and Scheduling Procedures |
| ISO 14644-1 | Basic | Clean rooms and associated controlled environments – Part 1: classification of air cleanliness |
| ISO 14644-2 | 2000 9/15/2000 | Clean rooms and associated controlled environments – Part 2: specifications for testing and monitoring to prove continued compliance with ISO 14644-1-First Edition |
| IRIG-106-99 | | Telemetry Standards |
| ISO 9000-3 | 2004 2/15/2004 | Software Engineering Guideleines for the Application of ISO 9001:2000 to Computer Software- Premiere Edition |
| ISO 19011 | Base 10/1/2002 | Guidelines for Quality And/Or Environmental Management Systems Auditing- First Edition |
| JSC SN-C-0005 | D | Space Shuttle Contamination Control Requirements |
| MIL-STD-1553 ¹ | B | Digital Time Division Command/Response Multiplex Data Bus |
| MIL-STD-1540 | B or C | Test Requirements for Launch, Upper-Stage, and Space Vehicles |
| MIL-STD-176 | A, Notice 1 | Weight and Balance Data Reporting Forms for Guided Missiles and Space Launch Vehicles |
| MIL-STD-1773 | Notice 1 | Fiber Optics Mechanization of an Aircraft Internal Time Division Command/Response Multiplex Data Bus |

| | | |
|-----------------|----------------|--|
| IEST-STD-CC1246 | D 1/1/2002 | Product Cleanliness Levels and Contamination Control Program |
| MIL-PRF-27401 | D 10/3/1995 | Propellant Pressurizing Agent, Nitrogen |
| NASA RP-1124 | 4 1997 | Outgassing Data for Selecting Spacecraft Materials |

¹ MIL-STD-1773 may be substituted

8 REFERENCE Documents

The following documents are hereby incorporated by reference. The Contractor shall comply with the Government's implementation of these policies and instructions.

| Document No. | Document Title |
|---------------------|---|
| NPD 8610.23A | Technical Oversight of Expendable Launch Vehicle (ELV) Services |
| NPD 8610.24B | Launch Services Program (LSP) Pre-Launch Readiness Reviews |
| NPD 8610.7C | Launch Services Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Missions |
| PMI K-ELV-10.2 | ELV Program Management Instruction for Launch Vehicle Qualification |

EXHIBIT 1**CAPABILITIES, SPECIFICATIONS AND ENVIRONMENTS**

Exhibit 1 represents the capabilities, specifications, and environments of the proposed launch services, including all standard launch service and non-standard services.

1.0 VEHICLE CONFIGURATION

The Contractor shall define (in Table D1-C) the vehicle, Solid Rocket Motor (SRM), upper stage, Payload Adapter (PA), and Payload Fairing (PLF) configuration options available for each proposed vehicle class. These configurations shall include all standard electrical systems, mechanical systems, propulsion systems, ordnance devices, and flight instrumentation.

| Vehicle Configuration | SRM Configuration | Upper Stage | PA | Fairings | |
|-----------------------|-------------------|-------------|------------------|----------|-----|
| Falcon 1 | N/A | K2 | 38.81" LightBand | 1.5m | N/A |

Table D1-C: Vehicle Configurations

2.0 PAYLOAD DELIVERY CAPABILITY

The Contractor shall provide, in Tables D1-D through D1-G, the maximum payload capability for each vehicle configuration defined in paragraph 1.0, Vehicle Configuration. Performance shall be expressed in terms of separated payload mass (assuming standard PAs as outlined in paragraph 1.0, Vehicle Configuration) and shall assume a 3-sigma performance reserve for the following orbits:

Low Earth Orbits (LEO): Data shall be provided for circular orbit altitudes from 200 to 2000 km (in increments of 100 km) for inclinations of 28.5, 38, 60, 70 and 90 degrees. Note: Falcon 1 margin to LEO is 100 lbs.

Sun-Synchronous Orbits: Data shall be provided for circular orbit altitudes from 200 to 2000 km. Note: Falcon 1 margin to Sun Synchronous Orbit is 100 lbs.

Ex 4

| Orbit Altitude (km) | | | | |
|---------------------------|--|-----|-----|-----|
| 200 | | 60 | 70 | 90 |
| 300 | | N/A | N/A | N/A |
| 400 | | N/A | N/A | N/A |
| 500 | | N/A | N/A | N/A |
| 600 | | N/A | N/A | N/A |
| 700 | | N/A | N/A | N/A |
| 800 | | N/A | N/A | N/A |
| 900 | | N/A | N/A | N/A |
| 1000 | | N/A | N/A | N/A |
| 1100 | | N/A | N/A | N/A |
| 1200 | | N/A | N/A | N/A |
| 1300 | | N/A | N/A | N/A |
| 1400 | | N/A | N/A | N/A |
| 1500 | | N/A | N/A | N/A |
| 1600 | | N/A | N/A | N/A |
| 1700 | | N/A | N/A | N/A |
| 1800 | | N/A | N/A | N/A |
| 1900 | | N/A | N/A | N/A |
| 2000 | | N/A | N/A | N/A |

**Table D1-D1: Maximum LEO Payload Capability for Falcon 1 Vehicle Configuration
from Cape Canaveral AFS**

| Orbit Altitude (km) | |
|---------------------------|--|
| 200 | |
| 300 | |
| 400 | |
| 500 | |
| 600 | |
| 700 | |
| 800 | |
| 900 | |
| 1000 | |
| 1100 | |
| 1200 | |
| 1300 | |
| 1400 | |
| 1500 | |
| 1600 | |
| 1700 | |
| 1800 | |
| 1900 | |
| 2000 | |

Ex 4

**Table D1-E: Maximum LEO and Sun-Synchronous (SSO) Payload Capability from
Omelek Island -US Army Kwajalein Atoll**

3.0 INSERTION ACCURACIES

The Contractor shall provide standard insertion accuracies for each vehicle configuration defined in paragraph 1.0 for each of the maximum and minimum mission profiles defined in paragraph 2.0. Table D1-H lists example orbital parameters that should be considered.

EX4

Table D1-H: Standard Insertion Accuracy Requirements

4.0 PAYLOAD SEPARATION ATTITUDE ACCURACY AND RATES

Standard payload deployment attitudes/rates shall be provided in Table D1-I. Errors are defined for each vehicle configuration and consist of all known dispersion sources (guidance, navigation, ACS limitations, LightBand separation mechanism, etc.) Values provided reflect the generic capabilities of the launch vehicle, and all assumptions made with respect to payload mass properties shall be stated. The capability in Table D1-I includes a payload mass of 692 lbm and a payload center of gravity 27 inches above the payload interface.

Ex. 4

Note: Provisions are available for payload pointing and roll prior to payload separation and during coast phases for sun avoidance and thermal control. The quantity of provisions available is mission specific due to the fact that the consumable provisions pneumatics and battery power are used on other system that have varying demands depending on the mission design.

5.0 PAYLOAD FAIRING (PLF)

The Contractor shall provide a diagram of the maximum payload static envelope and the associated dynamic envelope for a rigid payload hard mounted to the PA. *A separate diagram for each PLF/PA combination specified in paragraph 1.0 shall be provided.*

EX. 3
EX 4

6.0 MECHANICAL INTERFACE

The Contractor shall provide a diagram that illustrates the various payload adapters and associated interfaces available through the launch service. A *separate diagram for each adapter shall be provided.*

Ex. 3

Ex. 4

Ex. 3

Ex. 4

Ex. 4

Ex.4

8.0 PAYLOAD ENVIRONMENT

The Contractor shall provide data for the maximum payload acoustic, vibration, shock, and acceleration, and thermal environment levels during launch and ascent. The maximum electromagnetic radiation levels encountered by the payload shall be depicted in Figure D1-3. The Contractor shall illustrate the pressure profiles and depressurization rates for each PLF in Figure D1-4. The maximum expected payload flight environments due to acoustics (50% fill), vibration, and shock shall be shown in Tables D1-K, D1-L, and D1-M, respectively. The maximum expected total acceleration (limit load factors), including uncertainty factors, shall be shown in Table D1-N (key dynamic events may be broken out as appropriate). The maximum expected sinusoidal vibrations at the base of the PA shall be shown in Table D1-O. The maximum quasi-steady acceleration as a function of payload separated mass shall be shown in Figure D1-5. The Contractor shall provide the maximum thermal environment during ascent for every launch component (i.e., upper stage, unblanketed skin, thermal/acoustic blankets, etc.) inside the fairing with a view factor to the payload in Figure D1-5A.

Ex. 4

Ex. 4

Ex 4

Ex 4

Ex. 4

Ex.4

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Ex 4

Ex. 4

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Ex.4

Ex. 3

Ex. 4

Ex.3

Ex.4

10.0 GENERIC SECONDARY PAYLOAD CHARACTERISTICS/INTERFACE

The allowable characteristics of generic secondary payloads shall be specified in Table D1-Q. The mechanical interface, allowable mass properties and envelope shall be standardized for both separating and non-separating secondary payloads. The Contractor shall illustrate both the separating and non-separating secondary payload interfaces in Figures D1-6 and D1-7 respectively. Sufficient clearance between the secondary payload envelope and the launch vehicle shall be allowed so as to not require measurement of the secondary payload. A fit check of the secondary payload shall be performed. A generic separation system shall be provided for separating secondary payloads. The separation event shall be sequenced and controlled by the launch vehicle. The launch vehicle must be able to verify command sequencing.

The Contractor shall provide the capability for secondary payload battery trickle charge through an existing fairing access door. Charging may be required until fairing close-out. Charging equipment and cabling will be provided by the secondary payload agency.

Ex.3

Ex.4

Ex. 3
Ex. 4

Ex. 3
Ex. 4

Ex. 3
Ex. 4

Ex. 3

Ex. 4

Attachment D1

Exhibit 1 F-9

Attachment D1 Technical Acceptability Statement of Work and Exhibit 1 for Falcon 9 Space Exploration Technologies

| | | |
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STATEMENT OF WORK

1 Introduction

1.1 Scope

This Statement of Work (SOW) and all Exhibits and documents attached or referenced herein define the Government's requirements for the Contractor to provide launch services in support of NASA's Launch Services Program Office (LSPO). The scope of this contract effort includes up to and including risk category 2 launch services capable of delivering, at a minimum, a 250kg payload to orbit at an altitude of 200 km and a launch inclination of 28.5°. Note SpaceX will onramp Falcon 9 for Category 2 during the next open season.

This SOW defines the overall launch service requirements for 'NASA or NASA-sponsored payloads' (hereinafter referred to as 'payloads'). The Contractor shall perform all tasks necessary to safely and reliably launch payloads in accordance with NASA-defined mission objectives. The Contractor shall support advance planning and perform analysis tasks as directed by the Contracting Officer.

It is the general contemplation of the parties to this contract that the Contractor shall have a broad mission in performing launch service related functions for the Government and designees. Therefore, the general scope of the contract covers any launch service and launch service related activities arising from the SOW in support of earth and space science exploration, and space station re-supply.

1.2 Objectives

The goal of the NASA Launch Services (NLS) contract is to provide the Agency with domestic launch services that are safe, successful, reliable, and affordable. The launch services will be provided at a fixed price. The contract will, to the maximum extent practical, incorporate best commercial practices.

The objectives of this contract are to:

- Ensure the safety of the public and all personnel, hardware, and property associated with the launch services.
- Provide affordable, accurate, and on-time delivery of LSPO manifested payloads to space.

- Provide a mechanism to incorporate new launch services, technology upgrades, improved systems engineering processes, and advances in manufacturing techniques.
- Provide risk mitigation while utilizing commercial practices.
- Provide flexible manifesting policy that recognizes the national priorities of NASA missions.
- Provide a capability to optimize cost, schedule, and performance to satisfy mission objectives.
- Provide for clear Government visibility into program schedule, technical performance, and risk.
- Foster competition and create opportunities for new, emerging launch service providers.
- Promote partnering among customers, launch service provider, and the LSPO program to maximize flexibility and responsiveness to customers needs.

1.3 Compliance Documents

The Contractor shall comply with the requirements contained in the following documents.

| Document No. | Revision | Document Title |
|---------------------------------------|-------------------|---|
| Air Force Space Command Manual 91-710 | July 2004 | Range Safety User Requirements ¹ (Replaces NASA RFP document EWR 127-1 which is not in use for Falcon 9) |
| ISO 9001/2000-2000 | | International Organization of Standardization |
| KHB 1710.2 | E-1 April 2002 | KSC Safety Practices Handbook ^{2,3} |
| NPD 8710.3 | B, April 2004 | NASA Policy For Limiting Orbital Debris |
| NASA-STD-8719.9 | May 2002 | NASA Safety Standard for Lifting Devices and Equipment ² |

¹ Any agreements between the Contractor and the Range for a tailored AFSPCMAN 91-710 are acceptable to NASA.

- ² The Contractor shall comply with the latest revisions of KHB 1710.2E and NASA-STD-8719.9 for processes performed in NASA facilities.
- ³ Any agreement between the Contractor and NASA for a tailored KHB 1710.2 are acceptable.

1.4 Definitions

Mission Specific: all standard, non-standard, and mission unique services provided to meet the requirements of the payload and mission.

Mission Unique: services provided that are newly performed or developed to meet mission requirements and that are not included in the standard and non-standard services. Typically these pertain to first flight items.

2 Standard Launch Service

The Contractor shall perform all launch service tasks necessary to deliver payloads to defined orbital parameters in compliance with mission requirements. The launch service shall support missions to all orbital parameters, consistent with vehicle configuration capabilities and launch Range restrictions. The Contractor shall provide launch services, which are in compliance with all Range requirements. The Contractor shall make all arrangements with the responsible authorities for the required launch Range authorization and support for vehicle processing; integrated payload/vehicle processing, launch; and launch site maintenance and modifications. NASA reserves the right to approve the choice of launch site [e.g. Cape Canaveral Air Force Station (CCAFS), Vandenberg Air Force Base (VAFB), Reagan Test Site (RTS)].

The Contractor shall furnish all services, maintain all equipment and infrastructure including, but not limited to: program management, mission integration, launch site support, ground and flight system safety, and performance assurance, necessary to accomplish the safe and successful launch of payloads to the required orbit conditions within required launch periods. The Contractor shall provide facilities and services at Contractor facilities for NASA personnel performing insight and approval functions during the performance of the contract. The Contractor shall provide access to launch vehicle documentation in support of NASA insight and approval functions.

The Contractor shall provide all necessary services, test hardware and software, and mission specific elements required to integrate the payload(s) to the launch vehicle systems. The Contractor shall meet all launch service performance requirements described in Exhibit 1, Capabilities, Specifications and Environments. All capabilities and conditions stated in Exhibit 1 must be consistent and compatible with all other capabilities and conditions stated in Exhibit 1 and in response to the requirements of the SOW. Any exceptions to the

stated capabilities or conditions must be specifically noted.

The Contractor shall coordinate with NASA Public Affairs Office all press releases concerning launches under this contract. During vehicle build-up, payload integration, and launch countdown, the Contractor shall allow NASA Public Affairs access to facilities to photograph and videotape activities, including hazardous operations. The Contractor shall assist NASA Public Affairs in developing the launch commentary for NASA Television by furnishing launch countdown and operations background material. The Contractor may also be asked to provide information to support the development of the press kit document and the NASA pre-launch and post-launch news conferences. The Contractor shall coordinate with NASA Public Affairs Protocol and Guest Services a minimum of sixty (60) days in advance of each launch to determine any special requirements.

The Contractor shall provide standard launch services as delineated in Exhibit 2, Standard Services List. All hardware, software, analyses, and support required to provide each item listed in Exhibit 2, shall be included in the standard launch service.

All Data Requirements List (DRL) and Supplemental Data List (SDL) items, identified in Attachment D2 and D3 respectively, shall be included in the standard launch service.

2.1 Launch Vehicle (LV)

The standard launch service shall include, as a minimum, the following:

- (A) Launch timing capabilities with
 - (i) Launch periods (campaign) as small as 14 days in duration
 - (ii) Multiple approximately 24 hour re-launch attempts in the event of a launch scrub
 - (iii) Instantaneous launch window
 - (iv) Simultaneous planetary launch campaigns, with launches separated by 30 days
 - (vi) Trajectory targeting at multiple flight azimuths on any one day of the launch period

(B) A launch vehicle and Payload Adapter (PA) with appropriate electrical and mechanical interfaces (as described in Exhibit 1) required for payload integration and testing.

(C) A payload separation system with the following characteristics:

- (i) The payload shall be protected from debris generated by the separation system.
- (ii) The separation system shall function in a manner that prevents any re-contact with the payload, including Contractor-provided attach hardware on the payload, by the upper stage or any element of the separation system once separation has been initiated.
- (iii) Redundant payload separation indications.

Ex. 4

Ex.4

2.2 Program Management

The Contractor shall provide all program management functions required to provide the launch services and to satisfy the mission requirements for each NASA mission. The program management function of this contract shall provide insight to NASA for all technical and programmatic activities performed under this contract.

The Contractor shall coordinate all program management functions and issues directly with the KSC LSPO designated representative(s). The NASA

Contracting Officer is the only NASA representative authorized to provide formal contract direction.

2.2.1 Formal Reviews

The Contractor shall conduct program reviews, design reviews, and readiness reviews, and shall provide for the participation of NNC. The Contractor shall provide minutes and action items resulting from each review to NASA within one week after the review. A copy of the presentation material shall be available at the review for all NNC attendees (DRD C1-1).

2.2.1.1 Program Reviews

During the contract performance period, the Contractor shall conduct Program Reviews with NASA at least once per year to: report development and production status, ensure schedules support program objectives, review action items, review program schedules, and discuss any issues. The intent of the program review is to provide a forum for open dialog between NASA and the Contractor with respect to launch services. NASA will provide status of Agency direction at the reviews. The review location shall alternate between NASA and Contractor facilities unless mutually agreed upon to do otherwise.

2.2.1.2 Design Reviews – Mission Unique

The Contractor shall conduct and chair/co-chair design reviews, as described below, that apply to the system, subsystem, component, and software level for all first flight mission unique items. Where there is not a direct match between a SOW specified mission unique design review(s) and the Contractor's standard review(s), the Contractor's review process will be acceptable provided it addresses equivalent content. For items previously flown, the following design reviews will not be required, provided the Contractor allows insight into design and prior performance of each item.

(A) Mission Unique Requirements Review (MURR)

The Contractor shall conduct a MURR prior to the Mission Unique Preliminary Design Review (MUPDR) with NNC to review the mission unique design requirements for the following items:

- (i) System requirements' identification and definition to a level adequate to verify launch vehicle performance capabilities.
- (ii) Design restrictions, limitations, and known violations.

- (iii) Physical and mechanical interfaces (e.g., payload to launch vehicle, payload envelope, and access provisions).
- (iv) Electrical interfaces (e.g., launch vehicle to payload, payload to umbilical, interfaces with electrical ground support equipment, pad electrical systems, ground batteries, telemetry, grounding, and power).
- (v) Functional interfaces (e.g., structures, structural loads, and vibration).
- (vi) Avionics systems and interfaces (e.g., payload avionics interfaces with launch vehicle, separation systems, telemetry interfaces, payload command and telemetry, and RF).
- (vii) Mass properties.
- (viii) Environmental requirements (e.g., thermal, contamination, vibration, pressure, Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC), shock, launch complex RF, and lightning).
- (ix) Orbital requirements, launch vehicle performance, launch window injection, and deployment attitudes and rates.
- (x) Payload/Launch Vehicle (LV) separation requirements (e.g., separation conditions, launch vehicle post-separation maneuver requirements, and telemetry).

(B) Mission Unique Preliminary Design Review (MUPDR)

The Contractor shall conduct a preliminary detailed design review prior to major commitment to drawings and design. Mission unique trade studies shall be completed prior to the MUPDR. The Contractor shall discuss analyses performed and their results along with comparisons to any similar proven designs. The Contractor shall evaluate the safety of the design and its ability to meet safety requirements. The preliminary design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUPDR:

- (i) All system requirements have been allocated to the subsystem and component level and the flow down is adequate to verify system performance.
- (ii) The design solutions being proposed are expected to meet the performance and functional requirements.

- (iii) The design does not pose major problems that may cause schedule delays.
- (iv) Overall system architecture has been established and all launch vehicle to payload interfaces have been identified and are verifiable.
- (v) The design solution can be produced based on existing processes and techniques; if not, risk areas, which require unique and unproved processes, are identified and risk mitigation plans are established.
- (vi) An acceptable operations concept has been developed.
- (vii) Preliminary LV interfaces have been defined.
- (viii) Preliminary plans are established for end-to-end testing methodologies.
- (ix) 30% drawings released.

(C) Mission Unique Critical Design Review (MUCDR)

The Contractor shall conduct a MUCDR prior to design freeze and before significant fabrication activity begins. The Contractor shall present a final detailed design using drawings, analyses, and evaluation testing that shows the design meets final performance and interface specifications, safety requirements, and mission objectives. The Contractor shall provide selection criteria for the evaluation tests performed to prove validity. The critical design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUCDR:

- (i) All technical problems and design anomalies have been resolved without compromising system performance, reliability and safety.
- (ii) The detailed design will meet performance, functional requirements, and schedule.
- (iii) Software simulations and prototyping results do not present any potential mission risks.
- (iv) All key subsystem and/or component engineering analyses are complete.
- (v) Integrated safety analysis identifying any remaining hazards and proposed resolution.
- (vi) Launch vehicle/payload compatibility test plans have been defined.

(vii) 90% drawings released.

2.2.1.3 Readiness Reviews

The Pre-Mate Readiness Review, Launch Management Coordination Meeting (LMCM), Launch Readiness Review (LRR), and Flight Readiness Review (FRR) described herein will be conducted for each NASA mission.

(A) Pre-Mate Readiness Review

The Contractor shall conduct a Pre-Mate Readiness Review to demonstrate the launch site and launch vehicle are ready for payload mechanical and electrical integration. The Contractor shall conduct an LV/site walk-down [reference SOW Section 2.4.1.1(D)] with NNC participation prior to or in conjunction with the Pre-Mate Readiness Review. The Contractor shall present as a minimum:

- (i) Action item status, safety status, payload mating plan, closure plan, payload integration/launch site documentation, interface verifications, checkout and launch software status, nonconformance reports, launch site status, and review of flight profile.
- (ii) A detailed schedule showing all activities remaining to achieve an on-time launch.

(B) Launch Management Coordination Meeting (LMCM)

The Contractor shall participate in an LMCM conducted by NASA before each launch dress rehearsal or launch. The LMCM is used to ensure the readiness of the launch team to execute the procedures necessary to conduct the launch dress rehearsal (reference SOW Section 2.4.1.3) or launch. At this meeting, participant roles and responsibilities during countdown shall be identified. The Contractor shall develop and present a decision matrix for its launch team which defines who has authority to issue a GO, NO GO, and HOLD during launch countdown. The Contractor shall describe its launch day management activities, identify key team members, and define responsibilities and communications between the launch vehicle, NASA, and payload teams.

(C) Launch Readiness Review (LRR)

NASA will conduct/chair, and the Contractor shall participate in an LRR for each mission to ensure the specific launch vehicle is acceptable for flight and all Range and other mission requirements have been met, or will be satisfied

prior to launch. The LRR is held approximately three days before launch. As a minimum, the Contractor shall provide verification that:

- (i) All critical items required to proceed into final launch countdown are ready.
- (ii) Vehicle configuration is defined and all vehicle systems have been verified per launch site test plans.
 - (a) Updated final mission analysis (performed with final mass properties) has not significantly changed the mission plan
- (iii) All previously recorded action items have been closed or are reflected on the schedule.
- (iv) All previously held Contractor's readiness review actions have been closed or resolved.
- (v) Launch site/Range support organizations have committed to launch.
- (vi) Tracking and data support resources are committed to launch.
- (vii) Any open work is identified and closeout plans and schedules are in place and supportable.
- (viii) Any constraints to launch are identified and resolution plans developed.
- (ix) Mission risks are known and documented.
- (x) Launch commit criteria for payload and launch vehicle is approved and released.

The Contractor shall also discuss:

- (i) Anomalies from previous missions, including non-NASA missions
- (ii) Hardware/software failures in the field either on our vehicle or in the fleet
- (iii) Open corrective actions/problems reports
- (iv) First flight items

(D) Flight Readiness Review (FRR)

NASA will conduct/chair, and the Contractor shall participate in an FRR one day prior to launch to verify all actions from the LRR are complete and final processing has been successfully completed. NASA will appoint the chairperson for this review. At the conclusion of this review, an "approval to proceed with launch countdown" is given. Representatives from the Contractor, Range, and NNC agencies sign the Certificate of Flight Readiness. The Contractor shall prepare the Certificate of Flight Readiness. A sample Certificate of Flight Readiness is provided in Exhibit 4.

2.2.2 Risk Management

The Contractor shall implement risk management techniques that address the identification, analysis, mitigation, and tracking of potential impacts to mission success. The Contractor shall develop the criteria, methods, and procedures used for identifying critical items.

2.2.3 Configuration Management

The Contractor shall perform configuration management of the launch vehicle design and production for all launch vehicle components/subsystems, hardware, and software.

2.2.4 Manifest Policy

The Contractor shall develop a manifest policy that addresses the Contractor's overall approach to ensuring timely launch of payloads. The Contractor shall provide a five-year planning manifest to the Government (DRD C1-4) to support Government mission scheduling.

2.2.5 New Launch Vehicle Orientation

At the initiation of a new launch service the Contractor shall support an orientation briefing at KSC. This briefing shall introduce Contractor personnel and establish project interfaces with NASA personnel and describe the Contractor's organization and infrastructure. The briefing shall contain information summarizing the design, performance, fabrication, integration, testing, qualification and operational features of the launch vehicle systems and supporting facilities required to provide the launch service in the form of diagrams, schematics, pictures, drawings, videos, etc.

2.3 Mission Integration Services

2.3.1 Mission Integration Management

The Contractor shall be responsible for managing the mission integration of the payload flight and ground systems with the launch vehicle and its associated GSE. In accordance with this responsibility, the Contractor shall perform, as a minimum, the following services:

- (A) Provide a single point of contact with overall mission responsibility for each mission. This single point of contact shall be responsible for coordinating support from all technical disciplines and management during the integration process.
- (B) Conduct mission integration meetings (kick-off, working group, technical interchange) approximately quarterly from L-27 months to launch
- (C) Provide a co-chairperson along with NASA for all working groups and technical interchange meetings. The Contractor co-chairperson shall be responsible for preparing and distributing agendas, minutes and action item logs for each meeting. The Contractor shall maintain the action item database and ensure closure of all actions.
- (D) Provide appropriate technical/engineering representation at payload preliminary and critical design reviews.
- (E) Plan, schedule, and manage mission analyses required to define and verify compatibility of the payload with the interface requirements and environments (reference Table D1-A, SOW paragraph 2.3.2).
- (F) Track development status of and resolve issues associated with mission specific hardware and software.
- (G) Coordinate interface and support requirements for the mission.
- (H) Plan/coordinate mission specific flight operations.
- (I) Manage integration activities at the launch site.
- (J) Manage and coordinate the launch vehicle safety approval process.
- (K) Prepare, maintain and implement a payload to launch vehicle ICD for each mission. Implement the ICD verification matrix. The ICD shall include all mission requirements including LV and launch site interface definition and environments. The ICD shall include the payload to LV/launch site electrical and mechanical interface drawings (DRD C2-1).
- (L) Manage the design, development, qualification, testing and integration of mission unique requirements.

- (M) Evaluate the capability of the launch vehicle and define any performance and payload volume the Contractor may make available to NASA for secondary payloads.
- (N) Provide mission status to NNC throughout the launch campaign from Authority to Proceed (ATP) through mission success determination.

2.3.2 Mission Analyses

All vehicles provided under this contract shall include the following analysis for each mission as part of the standard launch service. The Contractor shall prepare and submit the standard mission analyses as listed in Table D1-A.

Ex. 4

The standard launch service shall include all analyses required to demonstrate compliance with NPD 8710.3, NASA Policy for Limiting Orbital Debris.

2.3.3 Mission Success Determination

Mission success will be based on the criteria set forth in Section C, paragraph 24.1, Mission Success Criteria. Mission success determination requirements are detailed in Section C, paragraph 24.2, Mission Success Determination.

The Contractor shall prepare and submit a Quick Look Flight Report (DRD C4-12) and a Final Flight Report (DRD C4-13). Within fifteen (15) days of receipt of the Final Flight Report, the Contracting Officer will either determine the launch a Mission Success or inform the Contractor of the Government's intent to withhold determination for payload evaluation.

2.4 Launch Site Support

2.4.1 Pre-Launch Checkout and Launch Support

2.4.1.1 Launch Vehicle Preparation and Launch

For launch services provided under this contract, the Contractor shall, as a minimum;

- (A) Perform all LV preparations and launch site operations necessary to safely and successfully deliver the payload to the desired orbit.
- (B) Generate the required documents and obtain all required safety approvals for the LV System and integrated payload/launch vehicle system operations including payload/LV system integration and launch operations.
- (C) Provide NASA access to all meetings including, but not limited to, scheduling meetings, test briefings, and technical meetings. Upon request, the Contractor shall provide copies of schedules, test briefings, and other material presented at technical meetings.
- (D) Conduct LV/launch site walk-downs with NNC participation.

2.4.1.2 Telemetry Data and Launch Countdown Support

2.4.1.2.1 Baseline Vehicle Support

The Contractor shall provide, in electronic and hard copy form, all raw LV telemetry (RF and hardwire) formats used in sufficient detail to allow NASA to process and verify the data (DRD C6-1). This shall include a detailed listing and description of all measurements and calibration coefficients for all LV telemetry (TM) links including the guidance system.

Upon NASA request, the Contractor shall provide NASA with a test tape representative of the telemetry (RF and hardwire) signals of the launch vehicle and GSE sufficiently prior to the initial power-up test on each mission to allow

NASA to verify its ability to process the Contractor's telemetry (SDL S6-1). Upon NASA request, the Contractor shall submit an end-to-end link test plan (SDL S6-2). The Contractor shall ensure proper operation of all LV telemetry links (RF and hardware), voice communication channels, and video to the NASA ground telemetry station prior to baseline launch vehicle processing. Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all significant vehicle test data (SDL S6-3). Upon NASA request, the Contractor shall provide real-time LV telemetry (RF and hardware) data to NASA's ground telemetry station(s). Examples include, but are not limited to telemetry test data during initial vehicle power application, flight simulation prior to payload mate, and flight simulation following payload mate.

2.4.1.2.2 Integrated Support

Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all integrated test data (SDL S6-3). Upon NASA request, the Contractor shall provide real time integrated test telemetry (RF and hardware) data to NASA's ground telemetry station(s).

2.4.1.2.3 Launch Countdown and Flight Support

The Contractor shall provide launch countdown procedures, Mission Constraints Documents (DRD C1-2) and a Mission Console Notebook (DRD C1-3).

The Contractor shall provide 10 NASA personnel access to consoles, with vehicle monitoring capabilities, co-located within the Contractor's launch control center. The Contractor shall provide access to real-time telemetry (RF and hardware), voice communication channels with talk/listen capabilities, video and telephones for the co-located NASA personnel.

The Contractor shall deliver real-time LV telemetry (RF and hardware), voice communication channels and video to the NASA ground telemetry station and the Payload Operation Control Center (POCC) from the start of launch countdown through Range Loss of Signal (LOS) when in range of an existing ground receiving station, or as supplemented as described in SOW paragraph 2.4.3, Range Support and Services. NASA will be responsible for any distribution off base. If the LV telemetry, voice communication channels or video is uniquely encoded, the Contractor shall provide the decoded LV telemetry, voice communication channels, and video.

The Contractor shall receive and record the raw LV telemetry data for all phases of powered flight, from two (2) minutes prior to stage ignition through 60 seconds after stage shutdown. The Contractor shall receive and record LV telemetry from 30 seconds prior to and 5 seconds after payload separation (additional LV telemetry post payload separation can be accommodated as an optional service). For all mandatory receive and record vehicle TM coverage times, real time

transmission back to the NASA TM station shall be provided whenever possible. Post launch and upon request, the Contractor shall provide the raw telemetry data recorded (SDL S6-3).

During the Launch Countdown, the Contractor shall poll NASA at key milestone events for GO/NO-GO status. The final poll shall include the NASA Launch Manager's GO/NO-GO status for launch. The Contractor shall provide NASA access to anomalies and concurrence with anomaly resolution prior to proceeding with Launch Countdown. The Contractor shall poll NASA for any recycle of the Launch Countdown.

2.4.1.3 Launch Dress Rehearsal

The Contractor shall conduct a minimum of one Dress Rehearsal prior to launch. The rehearsal shall exercise the launch countdown procedure, and will have the participation of the NNC and LV Contractor launch teams. The rehearsal may use an abbreviated countdown script with simulated payload/vehicle conditions, including anomalies.

2.4.2 Launch Site Payload Support

2.4.2.1 Payload Processing Facility

For launches conducted from CCAFS and VAFB, NASA will provide the Payload Processing Facility (PPF) unless processing services are purchased as a non-standard service. In the event the Contractor proposes and NASA approves an alternate launch site, the Contractor shall be responsible for providing a PPF, subject to NASA approval, meeting the payload requirements.

2.4.2.2 Launch Site Payload Integration Support

The Contractor shall provide all services, equipment, and support required for the integration and launch of each payload. Services shall include, as a minimum, the following:

- (A) Encapsulation of the payload complement at the PPF, for either flight or transport to the launch complex, mate with the LV and performance of integrated checkout activities.
- (B) Verification of the end-to-end functionality of the umbilical lines provided for payload use.
- (C) Support for the installation and checkout of the payload GSE (provided by the payload customer) at the launch site, and payload communication accommodations from the pad to the PPF. The Contractor shall also provide for a payload safety console at the Contractor's launch control center.
- (D) Provision of the mountings for, and the installation of, the payload GSE (provided by the payload customer) at the launch complex and/or remote sites.
- (E) Provision for contingency off-loading of payload propellants in accordance with the appropriate Range Safety requirements and appropriate payload procedures.
- (F) Provision for launch site services to meet payload requirements such as: power, air conditioning, GN₂/GHe purges, and contamination control.
- (G) Support of all activities required to de-mate and to return the payload to the processing facility if necessary.
- (H) Preparation of the procedures for integrated LV/payload operations for NASA approval and incorporation of the payload procedures as appropriate (DRD C5-5).

- (I) Coordination of payload and LV operations into an integrated operational flow, preparation of the schedules, and provision of the schedules with updates as needed to NNC.
- (J) Provision of contamination control for payloads while they are in the possession of the Contractor, or in a Contractor-provided PPF per the SOW, paragraph 2.4.2.3.
- (K) Provision of a payload protective cover for use after payload mate to the LV, if the fairing is installed at the launch pad. The cover shall be purged with conditioned air meeting the minimum requirements stated in the SOW, paragraph 2.4.2.3(C). Provisions shall be made for payload personnel ingress and egress.
- (L) Certification of payload contamination control requirements for: fairing surface cleanliness, cleanroom environments, and purge system cleanliness.
- (M) Support for the installation of customer provided RF re-radiating equipment.
- (N) Provision for the planning and execution of activities associated with the integrated testing of the customer's payload with the LV on the launch pad.

Ex.4

Ex. 4

2.4.2.4 Operational Support Services

The Contractor shall provide safety training, instruction, and certification for all Contractor-operated or provided integration facilities and launch sites to ensure users are aware of facility, launch site, launch vehicle and payload hazards and have adequate knowledge to carry out their tasks unescorted in a safe manner. The Contractor shall provide access for payload personnel to the payload/LV or storage facilities to accommodate payload customer requirements. The Contractor shall provide security to meet the requirements for payload or personnel protection.

2.4.3 Range Support and Services

Launch vehicles provided under this contract shall include all hardware, software, analysis and support necessary to meet the requirements of Air Force Space Command Manual 91-710, Range Safety User Requirements.

As part of the launch service, the Contractor shall make all launch Range support arrangements for: scheduling Range for launch and integrated testing, Range Safety functions, communications and timing, metric C-band beacon (radar) coverage, telemetry coverage, camera coverage of launch, and tracking and telemetry station acquisition predictions. If required, NASA will provide down range telemetry aircraft, Tracking and Data Relay Satellite System (TDRSS) and/or NASA owned ground station support for tracking and data recovery. The Contractor shall be responsible for coordinating and ensuring all tracking and data recovery support meets mission requirements (DRDs C2-3 and C2-4).

The Contractor shall make arrangements for Range provided services necessary to support the launch service. As a minimum, the following services are to be provided: fluids, gases, propellants, ordnance storage, facility usage, equipment support, shop and laboratory services, meteorology, base security, fire protection and environmental health.

The mission specific Program Requirements Document/Operational Requirements (PRD/OR)(DRD C2-2), or equivalent mission specific Range support documentation, shall be submitted to obtain Range support. The Contractor, with support from NASA, shall complete all forms pertinent to the mission and submit them to the appropriate Range for formal acceptance.

2.5 Safety, Reliability, and Quality Assurance

During the period of performance the Contractor shall establish, implement, and maintain comprehensive safety and health, reliability and quality assurance programs covering program management, mission integration management, and the design, development, production, test, integration and launch of the LVS.

2.5.1 Safety and Health Program

The Contractor shall provide a Safety and Health Plan that will implement safety requirements consistent with federal, state, and local government regulations and applicable NASA and Range Safety and Health requirements. This Plan shall describe the Safety organization including structure of management interfaces. Methods employed to ensure compliance with applicable safety requirements shall be identified in accordance with AFSPCMAN 91-710. When the contractor is performing work in any NASA owned or operated facility (e.g., buildings 836 and 1610 at VAFB, SAEF-2 and PHSF at KSC), all NASA requirements and documentation as contained in the SOW, paragraph 1.3, Compliance Documents, shall be adhered. Each Contractor employee on NASA property, or custodian of NASA assets elsewhere, is responsible for reporting mishaps (DRD C3-2). The Contractor shall make provisions for NASA safety representative insight into integrated Payload/LV processing.

The Contractor shall implement a system safety program, which identifies and controls system/subsystem hazards that affect personnel, flight hardware and facilities.

2.5.2 Reliability Program

The Contractor shall implement and maintain a Reliability Program with an overall vehicle design reliability of no less than 95% at an 80% confidence factor. The Contractor's program shall facilitate evaluation of the Contractor and subcontractor's programs to determine if the product meets the overall design reliability requirements. Overall vehicle reliability predictions shall be incrementally revised to reflect design modifications.

2.5.3 Quality Assurance Program

The Contractor shall maintain a quality management system that is ISO 9001/2000 third party certified. The Registrar shall be accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB). In the event the Contractor certification is revoked, NASA shall be notified within 5 business days (DRD C3-3).

The Contractor shall maintain a Software Assurance Program using ISO 9001/2000-3 as a guideline.

The Contractor shall accommodate NASA participation in Contractor and subcontractor ISO audits. NASA insight will consist of monitoring audits with the Contractor's auditors and inspectors in order to provide understanding of the Contractor's quality system and insight of their processes.

The Contractor shall support NASA performance of ISO 2nd party audits, as required. The audits will be performed in accordance with ISO 10011 requirements. The Contractor shall provide a current Audit Plan and schedule for in-house and sub-Contractor audits upon request from NASA (C3-4). The Contractor shall provide a copy of both the Contractor performed internal Quality Audit Report and the subcontractor/vendor Quality Audit Reports (C3-5), when requested by NASA.

The Contractor shall provide for NASA attendance at any flight hardware reviews the Contractor performs at Contractor or subcontractor facilities. The Contractor shall make available to NASA any build paper, test results, nonconformance reports, discrepancy history, statistical process control, and failure analyses that are relevant to the reviews.

The Contractor shall provide read-only quality information to NASA (via remote terminal) from such Quality Assurance on-line database systems as exist and to which the Contractor has regular and timely input. An example is an on-line Problem/Failure Reporting (P/FR) system.

The contractor shall provide NASA all anomaly resolutions that affect the integrated payload/launch vehicle assembly, including both hardware and software. NASA will approve all integrated payload/launch vehicle anomaly resolutions. The contractor shall provide insight to Material Review Board (MRB) and failure reporting for all criticality 1 anomalies.

The Contractor shall participate in the Government/Industry Data Exchange Program (GIDEP) and provide Alert System Documentation (DRD C3-1).

2.6 NASA Insight and Approval

The Contractor shall comply with the Government's implementation of NPD 8610.23 and NPD 8610.24 as defined under Section C, Clause 25.0 and the SOW paragraph 2.2.1, Formal Reviews. As part of the standard launch service, the Contractor shall provide the data, documentation, drawings, analytical models, and support services as necessary to accommodate the requirements specified under contract Section C, Clause 25.0, Government Insight and Approval.

The Contractor shall notify NASA of qualification or test anomalies involving similar launch vehicles, systems, subassemblies and components. The Contractor shall make available to NASA all problem reports or discrepancy reports on LV systems' failures and anomalies. This shall include insight into fleet-wide problems, anomalies, MRB actions, deviations or waivers to systems, subsystems, materials, processes, and test equipment including those used on non-NASA missions.

In the event of an anomaly or launch failure, the Contractor shall support NASA's Failure Review Board, if activated, or shall allow NASA to fully participate in the Contractor's Failure Investigation Board including those for non-NASA missions.

NASA may elect to have representation as a resident office at the Contractor's major manufacturing and engineering facilities for the life of the contract. The Contractor shall provide accommodations and services, such as badging, furniture, telephones, and use of easily accessible fax, viewgraph, and copy machines from one to three residents and up to four visitors. A minimum of two voice and two data phone lines shall be provided. Electronic data transfer compatibility between the resident office and off-site NASA institutions is required. A 'Resident Office' will not be required at CCAFS or VAFB, but NASA will require operational support accommodations (i.e. office space, power, phone, communication boxes for monitoring vehicle testing, etc.) at the launch complex during NASA launch operations.

3 Non-Standard Services

The Contractor shall provide the non-standard services identified in Exhibit 3 as directed by the Contracting Officer. Implementation of all non-standard services shall be fully compliant with this SOW.

4 Mission Unique Requirements

The Contractor shall provide the mission unique services identified in Exhibit 5 as directed by the Contracting Officer. Implementation of all mission unique services shall be fully compliant with this SOW.

4.1 Mission Unique Hardware

The Contractor shall design, manufacture, test, and qualify for flight the mission unique hardware that is required to support the payload and mission. The Contractor shall prepare and submit drawings (DRD C5-4), test plans (DRD C5-2), and test reports (DRD C5-3) to support NASA insight and approval of mission unique hardware.

For vehicle changes initiated by the Contractor that are not fleet-wide changes, the Contractor shall prepare and submit a vehicle data package (DRD C5-1).

The Contractor shall use MIL-STD-1540 B or C as a guideline when developing environmental qualification and acceptance criteria and related test and analysis. Factors of safety for mission unique hardware shall meet the requirements of Table D1-B.

| Application | Test | | Analysis (No Test) | |
|---------------|-------|----------|--------------------|----------|
| | Yield | Ultimate | Yield | Ultimate |
| Non-Man Rated | 1.10 | 1.25 | 1.65 | 1.90 |

Table D1-B: Mission Unique Hardware Factors of Safety

4.2 Mission Unique Software

The Contractor shall provide source code and mission constants' listings (DRD C4-11) with appropriate requirement specifications to support NASA approval of mission unique software. The Contractor shall prepare and submit a pre-flight control system and stability analysis report (DRD C4-6) for the vehicle and mission unique software used for each mission.

4.3 Unanticipated Mission Unique Services

At the time of contract award, the Government may not have identified all mission unique services required for each mission. As unanticipated mission unique services are identified, the Contracting Officer will authorize the Contractor, in accordance with FAR 52.243-1, Changes – Fixed Price Alt I, to perform these services. In performing unanticipated mission unique services, the Contractor shall design the necessary ground and flight hardware/software; conduct appropriate design reviews; and manufacture, test and qualify for flight LV mission unique hardware/software, i.e., other than that provided as a standard service (Exhibit 2) or described in the non-standard services list (Exhibit 3).

5 SPECIAL TASK ASSIGNMENTS

The Contractor shall be required to perform special studies and analyses, provide materials, or fabricate hardware in support of this contract. Each task will be initiated by written direction from the NASA Contracting Officer. These tasks generally include: advance planning and feasibility studies in support of future contemplated missions; analyses in support of change requirements to authorized missions; development, fabrication, and test of hardware/software to support planning studies or special tests; mission unique studies; material provision; and hardware fabrication in support of potential missions prior to mission authorization.

6 INFORMATION TECHNOLOGY SECURITY

The contractor shall comply with NPG 2810.1, NASA's Security on Information Technology Guideline. Existing systems retained by the contractor, shall be brought into compliance within six months of the contract start date. New

systems shall be compliant prior to authorization to process. The contractor shall develop, update and implement an IT Security Plan (DR-46). NASA IT Security personnel will perform the penetration testing requirements of NASA STD NPG 2810.1 section 4.6 per KDP-KSC-P-1334.

7 GUIDELINE DOCUMENTS

The following documents are to be used as guidelines to the extent specified in this SOW.

| Document No | Rev. | Document Title |
|---------------------------|-------------------|---|
| AFSPCI 10-1213 | 6/1/2004 | Spacelift Launch Strategy and Scheduling Procedures |
| ISO 14644-1 | Basic | Clean rooms and associated controlled environments – Part 1: classification of air cleanliness |
| ISO 14644-2 | 2000 9/15/2000 | Clean rooms and associated controlled environments – Part 2: specifications for testing and monitoring to prove continued compliance with ISO 14644-1-First Edition |
| IRIG-106-99 | | Telemetry Standards |
| ISO 9000-3 | 2004 2/15/2004 | Software Engineering Guidelines for the Application of ISO 9001:2000 to Computer Software- Premiere Edition |
| ISO 19011 | Base 10/1/2002 | Guidelines for Quality And/Or Environmental Management Systems Auditing- First Edition |
| JSC SN-C-0005 | D | Space Shuttle Contamination Control Requirements |
| MIL-STD-1553 ¹ | B | Digital Time Division Command/Response Multiplex Data Bus |
| MIL-STD-1540 | B or C | Test Requirements for Launch, Upper-Stage, and Space Vehicles |
| MIL-STD-176 | A, Notice 1 | Weight and Balance Data Reporting Forms for Guided Missiles and Space Launch Vehicles |
| MIL-STD-1773 | Notice 1 | Fiber Optics Mechanization of an Aircraft Internal Time Division Command/Response Multiplex Data Bus |

| | | |
|-----------------|----------------|--|
| IEST-STD-CC1246 | D 1/1/2002 | Product Cleanliness Levels and Contamination Control Program |
| MIL-PRF-27401 | D 10/3/1995 | Propellant Pressurizing Agent, Nitrogen |
| NASA RP-1124 | 4 1997 | Outgassing Data for Selecting Spacecraft Materials |

¹ MIL-STD-1773 may be substituted

8 REFERENCE Documents

The following documents are hereby incorporated by reference. The Contractor shall comply with the Government's implementation of these policies and instructions.

| Document No. | Document Title |
|----------------|---|
| NPD 8610.23A | Technical Oversight of Expendable Launch Vehicle (ELV) Services |
| NPD 8610.24B | Launch Services Program (LSP) Pre-Launch Readiness Reviews |
| NPD 8610.7C | Launch Services Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Missions |
| PMI K-ELV-10.2 | ELV Program Management Instruction for Launch Vehicle Qualification |

EXHIBIT 1

CAPABILITIES, SPECIFICATIONS AND ENVIRONMENTS

Exhibit 1 represents the capabilities, specifications, and environments of the proposed launch services, including all standard launch service and non-standard services.

1.0 VEHICLE CONFIGURATION

The Contractor shall define (in Table D1-C) the vehicle, Solid Rocket Motor (SRM), upper stage, Payload Adapter (PA), and Payload Fairing (PLF) configuration options available for each proposed vehicle class. These configurations shall include all standard electrical systems, mechanical systems, propulsion systems, ordnance devices, and flight instrumentation.

Ex. 4

2.0 PAYLOAD DELIVERY CAPABILITY

The Contractor shall provide, in Tables D1-D through D1-G, the maximum payload capability for each vehicle configuration defined in paragraph 1.0, Vehicle Configuration. Performance shall be expressed in terms of separated payload mass (assuming standard PAs as outlined in paragraph 1.0, Vehicle Configuration) and shall assume a 3-sigma performance reserve for the following orbits:

Low Earth Orbits (LEO): Data shall be provided for circular orbit altitudes from 200 to 2000 km (in increments of 100 km) for inclinations of 28.5, 38, 60, 70 and 90 degrees.

Sun-Synchronous Orbits: Data shall be provided for circular orbit altitudes from 200 to 2000 km.

High Energy Missions: Data shall be provided as a function of C_3 from $-10 \text{ km}^2/\text{sec}^2$ to $200 \text{ km}^2/\text{sec}^2$.

Geo-Synchronous Transfer Orbits (GTO): Data shall be provided for performance and ground rules for the vehicle's standard GTO, plus performance for insertion directly into Geo-Synchronous Orbits (GSO), if applicable.

Ex. 4

Ex. 4

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Ex. 3

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3.0 INSERTION ACCURACIES

The Contractor shall provide standard insertion accuracies for each vehicle configuration defined in paragraph 1.0 for each of the maximum and minimum mission profiles defined in paragraph 2.0. Table D1-H lists example orbital parameters that should be considered.

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5.0 PAYLOAD FAIRING (PLF)

The Contractor shall provide a diagram of the maximum payload static envelope and the associated dynamic envelope for a rigid payload hard mounted to the PA.

Ex. 3
Ex. 4

6.0 MECHANICAL INTERFACE

The Contractor shall provide a diagram that illustrates the various payload adapters and associated interfaces available through the launch service. *A separate diagram for each adapter shall be provided.*

The following drawings show the mechanical interface for the Falcon 9 payload separation system. This is a 6-point, 52.6 inch diameter separation system. SpaceX is also providing 937 mm and 1194 mm clampband separation systems for Falcon 9 payloads, but those payload adapter mounted separation systems do not have mechanical drawings that can be provided at this time.

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Ex. 4

Ex 3

Ex 4

Ex.3

Ex.4

Ex 3
Ex. 4

Ex. 4

8.0 PAYLOAD ENVIRONMENT

The Contractor shall provide data for the maximum payload acoustic, vibration, shock, and acceleration, and thermal environment levels during launch and ascent. The maximum electromagnetic radiation levels encountered by the payload shall be depicted in Figure D1-3. The Contractor shall illustrate the pressure profiles and depressurization rates for each PLF in Figure D1-4. The maximum expected payload flight environments due to acoustics (50% fill), vibration, and shock shall be shown in Tables D1-K, D1-L, and D1-M, respectively. The maximum expected total acceleration (limit load factors), including uncertainty factors, shall be shown in Table D1-N (key dynamic events may be broken out as appropriate). The maximum expected sinusoidal vibrations at the base of the PA shall be shown in Table D1-O. The maximum quasi-steady acceleration as a function of payload separated mass shall be shown in Figure D1-5. The Contractor shall provide the maximum thermal environment during ascent for every launch component (i.e., upper stage, unblanketed skin, thermal/acoustic blankets, etc.) inside the fairing with a view factor to the payload in Figure D1-5A.

Ex. 4

Ex.3

Ex.4

Ex.3

Ex.4

Ex. 3

Ex. 4

Ex.3

Ex.4

Ex.3

Ex.4

Ex3
Ex4

Ex.3

Ex.4

9.0 PAYLOAD ENVIRONMENT INSTRUMENTATION

Falcon 9 Payload Environment Instrumentation

To support mission success determination (Section C, paragraph 24.2), the following flight instrumentation shall be provided to monitor the payload environment. Table D1-P establishes the baseline requirements for payload environment instrumentation.

10.0 GENERIC SECONDARY PAYLOAD CHARACTERISTICS/INTERFACE

The allowable characteristics of generic secondary payloads shall be specified in Table D1-Q. The mechanical interface, allowable mass properties and envelope shall be standardized for both separating and non-separating secondary payloads. The Contractor shall illustrate both the separating and non-separating secondary payload interfaces in Figures D1-6 and D1-7 respectively. Sufficient clearance between the secondary payload envelope and the launch vehicle shall be allowed so as to not require measurement of the secondary payload. A fit check of the secondary payload shall be performed. A generic separation system shall be provided for separating secondary payloads. The separation event shall be sequenced and controlled by the launch vehicle. The launch vehicle must be able to verify command sequencing.

The Contractor shall provide the capability for secondary payload battery trickle charge through an existing fairing access door. Charging may be required until fairing close-out. Charging equipment and cabling will be provided by the secondary payload agency.

EXHIBIT 2

Ex.4

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Ex. 4

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Exhibit 2

Standard - Pg

Exhibit 2

STANDARD - f-1

EXHIBIT 2

STANDARD LAUNCH SERVICES LIST for FALCON 9

Ex.4

Ex. 4

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Ex. 4

Ex. 4

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Ex. 4

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EXhibit 3

Non Standard - P1

EXHIBIT 3

NON STANDARD LAUNCH SERVICES LIST for Falcon 1

SpaceX shall provide the capability to perform the following non-standard services.

- 1.0 Alternate Vehicle Configurations or Performance Enhancements N/A**
- 2.0 Alternate Fairing Configurations and/or Modifications**
 - 2.1** Alternate configurations N/A
 - 2.2** Additional access doors in excess of three included in standard service
Additional access doors of current standard size (see Exhibit 1) are available. Up to 1 per fairing half can be accommodated. Limitations for locations will be developed. This option must be ordered not later than 18 months from launch.
 - 2.3** Access doors of non-standard size.
Two doors up to 100 square inches in size can be accommodated. This option must be ordered not later than 18 months from launch.
 - 2.4** Mounting provisions, cabling and antenna systems for re-radiating signals from the payload to remote sites N/A for IDIQ (can be accommodated on a case by case basis)
 - 2.5** S, C, X, and Ku-band re-radiation equipment N/A for IDIQ (can be accommodated on a case by case basis)
 - 2.6** RF-transparent doors
Use of RF transparent material will be used in the existing fairing access doors. A no later than ordering date of L-18 months is applicable.
- 3.0 Alternate Payload Adapters (PAs)**
 - 3.1** Different size or different payload interface N/A at this time for IDIQ contract. Mission unique adapters can be evaluated on a case by case basis.
 - 3.2** Low tip-off rate Pas N/A at this time for IDIQ contract. Mission unique adapters can be evaluated on a case by case basis.
- 4.0 Upper Stage Hardware N/A**
- 5.0 Multiple PA, including Related Mission Integration Support N/A as an IDIQ non standard service but could be accommodated on a case by case basis**
- 6.0 Secondary PA for Non-Separating Secondary Payload N/A as an IDIQ non standard service but could be accommodated on a case by case basis**

SpaceX Company Proprietary and Competition Sensitive

- 7.0 Secondary PA/Separation System for Separating Secondary Payload N/A at this time**
- 8.0 RF Through-the-Fairing Transmission Capability (see 2.6—actual transmission is mission and trajectory dependent)**
- 9.0 Enhanced Electrical Interface**
 - 9.1 Increased capacity payload-to-GSE interface: N/A for IDIQ (can be accommodated on a case by case basis).
 - 9.2 LV command and control of payload: N/A for IDIQ N/A for IDIQ (can be accommodated on a case by case basis).
 - 9.3 LV supplied payload power capability N/A for IDIQ N/A for IDIQ (can be accommodated on a case by case basis).
 - 9.4 Enhanced telemetry capabilities N/A for IDIQ N/A for IDIQ (can be accommodated on a case by case basis).
 - 9.5 Additional LV environmental instrumentation: N/A for IDIQ (can be accommodated on a case by case basis).
- 10.0 LV Mounted Cameras (standard service includes fore and aft cameras)**
- 11.0 Special Contamination Control Options**
 - 11.1 Enhanced fairing environment
Dry, filtered nitrogen can be used for purging the payload fairing or additional filtration can support Class 10K air. This service can be ordered up to 6 months prior to launch.
 - 11.2 Enhanced fairing internal surface cleaning
Visibly clean level 2 is standard. VC Level 1 can be accommodated as an option. This includes UV inspection. For this, the light source is no less than 100 watts and located no more than 50cm from the inspected item. This service can be ordered up to 8 months prior to launch.
 - 11.3 Optional payload/vehicle integration environments. This can be ordered at any time with 6 months notice prior to intended use.
Class 10K integration space is available on a monthly basis. This includes the facility space, cleanroom suits, 10K filtration, monitoring. This can be ordered at any time with 6 months notice prior to intended use.
 - 11.4 Additional instrument purge system(s) up to T-0 N/A for IDIQ (can be accommodated on a case by case basis).
 - 11.5 Grade B Nitrogen (GN₂) or pure air cooling supply for spot cooling of payload components from payload mate or encapsulation up to T-0
- 12.0 Vehicle Data Book for Payload with Radioactive Components**

SpaceX will develop a vehicle data book to support payload analyses and
NLS Proposal Vol 1 Technical Acceptability Exhibit 3 Non Standard Service for Falcon 1

SpaceX Company Proprietary and Competition Sensitive

reviews for payloads with radioactive components. The databook shall contain a detailed description of the launch vehicle, the launch site infrastructure, the trajectory profile and instantaneous impact point history, and descriptions of possible accident scenarios, their environments, and probabilities of occurrence. This can be ordered at any time by the customer but requires 6 months to generate.

13.0 Co-Manifested Payload Mission Service

This capability can be evaluated on a case by case basis.

14.0 NASA Secondary Payload Mission Service

This capability can be evaluated on a case by case basis.

15.0 Payload Compatibility Assessment

SpaceX shall provide a document compiling all compatibility analyses performed on the co-manifested or secondary payload to verify the co-manifested or secondary payload does not unacceptably impact the primary. The specifics of the different analyses performed will vary from mission to mission and depend greatly on the nature of both primary and secondary payloads. Minimum elements of the document are: combined coupled loads analysis, critical clearance analysis, interface failure modes and effects analysis, safety assessment, combined thermal analysis, and mass properties/GN&C analysis, EMC compatibility.

16.0 Secondary Payload Mission Feasibility Study

A secondary payload mission feasibility study shall assess the performance capability and payload volume available to accommodate secondary payload missions on a non-interference basis with a given primary mission. Separating and non-separating secondary payloads shall be accommodated as a non-standard service.

17.0 Secondary Payload Accommodation Study

A secondary payload accommodation study shall address the suitability of and the approach for accommodating secondary payloads on a given vehicle configuration. The study shall develop a design, general payload requirements (secondary payload interface, volume, mass, environments) and implementation scheme for implementing both separating and/or non-separating secondary payloads. Dynamic loading analysis for generic secondary payloads shall be performed so that mission unique analyses are minimized.

18.0 Secondary Payload Mass Simulator

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A mass simulator shall be designed and fabricated to match the requirements (e.g., moment of inertia, rigidity, mass, and CG) of the secondary payload that will be replaced. The mass simulator shall also adhere to the requirements (e.g., contamination, cleanliness, and interface) identified in the ICD. SpaceX shall complete any other analyses or documentation required, for replacement of the secondary payload with the mass simulator.

19.0 Payload Processing Facilities

- 19.1 SpaceX shall provide the capability to provide non hazardous ground processing facilities for payloads at the Eastern Range in excess of the 4 weeks included in the standard service. SpaceX requires that this be procured with at least 6 months notice.
- 19.2 SpaceX shall provide the capability to provide nonhazardous ground processing facilities for payloads at the Western Range in excess of the 4 weeks included in the standard service. SpaceX requires that this be procured with at least 6 months notice.

20.0 Additional Mission Analysis and Support

- 20.1 Pedigree review.
A pedigree review of the vehicle system can be completed by the NLS customer. This will include review of the build paper/travelers (including acceptance tests for boxes and vehicle structures. Review will take place at SpaceX facilities. Up to two engineers will be made available to facilitate locating and review of paperwork. This can be procured at any time by the customer.
- 20.2 Support for additional mission integration working group meetings in excess of four per calendar year.
This can be procured at any time by the customer. Meetings are to be held at SpaceX facilities.
- 20.3 Mission analyses (e.g., PGAA, Trajectory, coupled loads, thermal, RF link, and fairing clearance) prior to ATP. These can be procured at any time by the customer.

21.0 Launch Call-Up Capability

- 21.1 Launch service price adjustment (credit or increase) for ATP at L-18 months.
- 21.2 Launch service price adjustment (credit or increase) for ATP at L-12 months.
- 21.3 Launch service price adjustment (credit or increase) for ATP at less than L-12 months will be assessed on a case by case basis.

22.0 NASA Public Affairs Office Support

Accommodations for NASA guests, in units of 10, to view launch, including local transportation, launch viewing facilities, lavatory accommodations,

SpaceX Company Proprietary and Competition Sensitive

food and beverage service, first aid and medical support for each proposed launch site. This should be procured with 3 months notice.

23.0 Contractor Defined Non-Standard Services

- 23.1 Fairing re-qualification for substantial changes to the baseline (excessive doors, additional umbilical, etc.
- 23.2 SpaceX can provide the capability to provide nonhazardous ground processing facilities for payloads at the Reagan test Site in excess of the 4 weeks included in the standard service. SpaceX requires that this be procured with at least 6 months notice.

EXhibit 3

Now Standard. F. 9

EXHIBIT 3

NON STANDARD LAUNCH SERVICES LIST for Falcon 9

SpaceX shall provide the capability to perform the following non-standard services.

- 1.0 Alternate Vehicle Configurations or Performance Enhancements N/A**
- 2.0 Alternate Fairing Configurations and/or Modifications**
 - 2.1 Alternate configurations
 - 4 m fairing see description in Exhibit 1
 - 2.2 Additional access doors in excess of three included in standard service
Additional access doors of current standard size (see Exhibit 1) are available. Up to 3 per half can be accommodated. Limitations for locations will be developed. This option must be ordered not later than 18 months from launch.
 - 2.3 Access doors of non-standard size.
Doors up to 36" diameter can be accommodated. This option must be ordered not later than 18 months from launch.
 - 2.4 Mounting provisions, cabling and antenna systems for re-radiating signals from the payload to remote sites N/A for IDIQ (can be accommodated on a case by case basis)
 - 2.5 S, C, X, and Ku-band re-radiation equipment N/A for IDIQ (can be accommodated on a case by case basis)
 - 2.6 RF-transparent doors
Use of RF transparent material will be used in the existing fairing access doors.
- 3.0 Alternate Payload Adapters (PAs)**
 - 3.1 Different size or different payload interface N/A at this time for IDIQ contract. Mission unique adapters can be evaluated on a case by case basis.
 - 3.2 Low tip-off rate Pas N/A at this time for IDIQ contract. Mission unique adapters can be evaluated on a case by case basis.
- 4.0 Upper Stage Hardware N/A**
- 5.0 Multiple PA, including Related Mission Integration Support N/A for IDIQ at this time but can be evaluated as a mission unique service.**
- 6.0 Secondary PA for Non-Separating Secondary Payload N/A for IDIQ at this time but can be evaluated as a mission unique service.**

SpaceX Company Proprietary and Competition Sensitive

- 7.0 Secondary PA/Separation System for Separating Secondary Payload**
N/A for IDIQ at this time but can be evaluated as a mission unique service
- 8.0 RF Through-the-Fairing Transmission Capability (see 2.6—actual transmission is mission and trajectory dependent)**
- 9.0 Enhanced Electrical Interface**
 - 9.1 Increased capacity payload-to-GSE interface: N/A for IDIQ (can be accommodated on a case by case basis).
 - 9.2 LV command and control of payload: N/A for IDIQ N/A for IDIQ (can be accommodated on a case by case basis).
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 - 9.4 Enhanced telemetry capabilities N/A for IDIQ N/A for IDIQ (can be accommodated on a case by case basis).
 - 9.5 Additional LV environmental instrumentation: N/A for IDIQ (can be accommodated on a case by case basis).
- 10.0 LV Mounted Cameras (standard service includes fore and aft cameras)**
- 11.0 Special Contamination Control Options**
 - 11.1 Enhanced fairing environment
Dry, filtered nitrogen can be used for purging the payload fairing. In addition, filtration can achieve Class 10K in the fairing. This should be ordered with 6 months notice.
 - 11.2 Enhanced fairing internal surface cleaning
Visibly clean level 2 is standard. VC Level 1 can be accommodated as an option. This includes UV inspection. For this, the light source is no less than 100 watts and located no more than 50cm from the inspected item. This should be ordered with 6 months notice.
 - 11.3 Optional payload/vehicle integration environments. This can be ordered at any time with 3 months notice prior to intended use.
Class 10K integration space is available on a monthly basis. This includes the facility space, cleanroom suits, 10K filtration, monitoring. This can be ordered at any time with 6 months notice prior to intended use.
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NLS Proposal Vol 1 Technical Acceptability Contract Exhibit 3 Non Standard Service for
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- 20.2 Support for additional mission integration working group meetings in excess of four per calendar year.
This can be procured at any time by the customer. Meetings are to be held at SpaceX facilities.
- 20.3 Mission analyses (e.g., PGAA, Trajectory, coupled loads, thermal, RF link, and fairing clearance) prior to ATP. This can be procured at any time by the customer.

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- 21.1 Launch service price adjustment (credit or increase) for ATP at L-18 months.
- 21.2 Launch service price adjustment (credit or increase) for ATP at L-12 months.
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SpaceX Company Proprietary and Competition Sensitive

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23.0 Contractor Defined Non-Standard Services

- 23.1 Fairing re-qualification for substantial changes to the baseline (excessive doors, additional umbilical, etc.
- 23.2 SpaceX can provide the capability to provide nonhazardous ground processing facilities for payloads at the Reagan test Site in excess of the 4 weeks included in the standard service. SpaceX requires that this be procured with at least 6 months notice.

Exhibit H

Sample Cert

EXHIBIT 4**SAMPLE CERTIFICATE OF FLIGHT READINESS**

The following entities certify that the necessary launch test operations to date have been completed for the launch vehicle and payload. Pending satisfactory closure of in-line work and any open items identified in the Launch Readiness Review, the launch vehicle, payload, and all supporting systems are ready for the launch operation.

Contractor Signature_____
NASA LSPO Signature_____
Payload Signature

Pending satisfactory closure of in-line launch vehicle, payload processing, and any open items identified in the Launch Readiness Review, the Range foresees no national resource protection or Range Safety issues, which would preclude launch.

Range Signature

Date: _____

Exhibit 7

Cert. Plan. A1

Exhibit 7
Falcon 1 Certification Plan

SPACE



Gwynne E. Shotwell
Vice President, Business Development

INTRODUCTION

SpaceX proposes to have NASA certify the Falcon 1 vehicle and operations for Risk Category 1 and 2 launch services. The Launch Vehicle risk categories are defined in NPD 8610.7 "Launch Services Risk Mitigation Policy for NASA-Owned or NASA Sponsored Payloads." This will be accomplished through a comprehensive series of Design and Operations Review Boards, audits of our Quality processes and verification program and a series of site visits. We propose to accomplish the vehicle certification for each SpaceX vehicle type independently with the exception of the corporate management process reviews and audits. These processes apply to the company as a whole and do not need to be repeated for each vehicle type. The SpaceX plan for Falcon 1 is to gain certification at the Risk Category 2 level and thus gain inherent certification as a Risk Category 1 launch service. A successful flight of a Falcon 1 powered by the Merlin 1C engine will demonstrate vehicle maturity and qualification. SpaceX will pursue certification per Risk Category 2 (Alternative 1 – certification after 1 successful flight of the Falcon 1 configuration). Per NPD 8610.7C and K-ELV-10.2, Falcon 1 will be certified prior to the launch of the NASA NLS payload.

The submittal of this plan, combined with the SpaceX NLS proposal, meets the instructions to request launch vehicle certification set forth in NASA's K-ELV-10.2 (Revision B February 2, 2001) Expendable Launch Vehicles Program PROGRAM/PROJECT MANAGEMENT INSTRUCTION. Throughout the certification process, SpaceX will encourage open dialogue to ensure timely exchange of appropriate documentation and to avoid unnecessary effort for either party. Upon completion of the certification process, SpaceX anticipates NASA will issue a letter informing us of the launch vehicle configuration's certification category.

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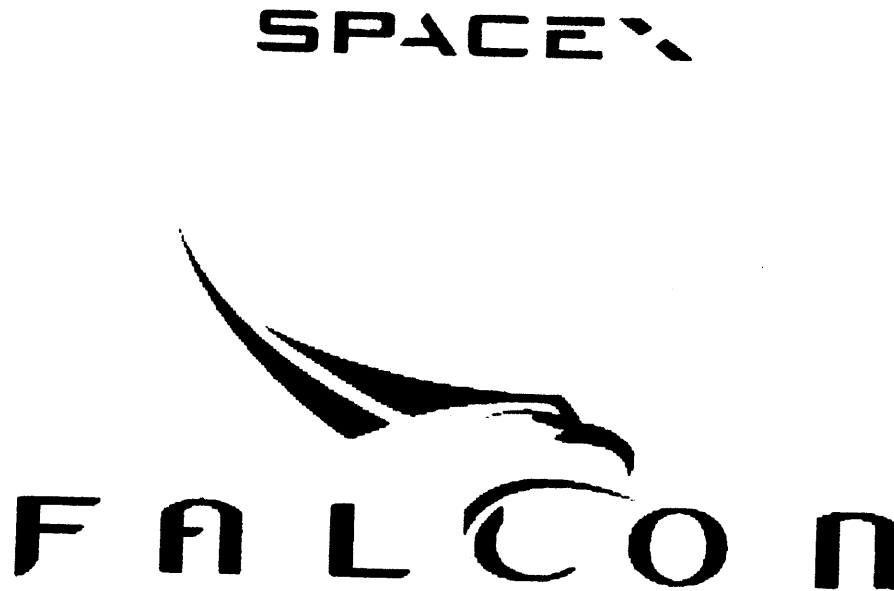
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Exhibit 7

Cert. Plan F.9

Exhibit 7
Falcon 9 Certification Plan



Gwynne E. Shotwell
Vice President, Business Development

INTRODUCTION

SpaceX proposes to have NASA certify the Falcon 9 vehicle and operations for payloads with risk Category 1 and 2. The payload risk categories are defined in NPD 8610.7 "Launch Services Risk Mitigation Policy for NASA-Owned or NASA Sponsored Payloads." This will be accomplished through a comprehensive series of Design and Operations Review Boards, site visits, and audits of our Quality processes and verification program. We propose to accomplish the vehicle certification for each SpaceX vehicle type independent of each other with the exception of the corporate management process reviews and audits. These processes apply to the company as a whole and so do not need to be repeated by vehicle type. Prior to issuance of mission Authority to Proceed (ATP), the proposed common launch vehicle configuration shall achieve one successful launch. Prior to the actual launch of the NASA payload, Falcon 9 shall be certified to the required payload risk category.

The submittal of this plan combined with our NLS proposal meets the instructions set forth in NASA's K-ELV-10.2 (Revision B February 2, 2001) Expendable Launch Vehicles Program PROGRAM/PROJECT MANAGEMENT INSTRUCTION, to request the certification. Throughout the certification process, open dialog is encouraged between SpaceX and NASA to ensure timely exchange of appropriate documentation and to avoid unnecessary efforts. Upon completion of the certification process, SpaceX anticipates NASA will issue a letter to the LSP informing us of the launch vehicle configuration's certification category.

For schedule purposes, an anticipated NLS contract was placed in August 2007. The Certification schedule will obviously move to the right as the contract emplacement is moved. The SpaceX plan is to request initiation of certification by the KSC ELV Program Office shortly after contract emplacement. This is per the K-ELV-10.2 procedure that details a certification process independent of a successful first flight. However, in order to best leverage development of products that support the first Falcon 9 flight, some proposed reviews will be delayed until products have been through a Government review. For example, the NASA policy directive (see table below) requires an assessment of compliance with Range Safety requirements. An Operations Review Board is proposed, but this System Safety assessment would be better scheduled after actual Eastern Range safety approval is achieved for the first Falcon 9 flight. An updated overview schedule will be provided once the contract emplacement date is better understood.

Ex. 4

Exhibit 8

Mission ICD

EXHIBIT 8

MISSION INTERFACE CONTROL DOCUMENTS

Thirty days prior to launch, the approved ICD shall be incorporated into the contract via contract modification as Exhibit 8 to Attachment D1. Any approved changes after its inclusion into the contract will be incorporated prior to mission success determination.

Attachment D2

DRL

"Competition Sensitive -- Contains Proprietary Background Data of Space
Exploration Technologies Corp. and ITAR-controlled Technical Data."

EX. 4

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Attachment D2: Data Requirements List

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Number: C1-3

DATA REQUIREMENT DESCRIPTION

Number: C1-4

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DATA REQUIREMENT DESCRIPTION

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Number: C3-1

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Number: C3-2

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DATA REQUIREMENT DESCRIPTION

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DATA REQUIREMENT DESCRIPTION

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DATA REQUIREMENT DESCRIPTION

Number: C4-9

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DATA REQUIREMENT DESCRIPTION

Number: C6-2

Attachment D3

Supp. Data

VOLUME 4
CONTRACT

ATTACHMENT D3
SUPPLEMENTAL DATA
REQUIREMENTS LIST

Attachment D3 Supplemental Data Requirements List

SpaceX will provide the following data items as requested by NASA.

| ITEM | DESCRIPTION |
|--------------------------|-----------------------------|
| S1: Documentation | |
| S1-1 | Launch Service User's Guide |

| | |
|------------------------------|-----------------------------|
| S3: Mission Assurance | |
| S3-1 | Reserved |
| S3-2 | Reserved |
| S3-3 | As-Built Configuration List |

| | |
|---------------------|---------------------------------|
| S4: Analysis | |
| S4-1 | Mission Battery Budget Analysis |
| S4-2 | EED's Compatibility Analysis |

| | |
|------------------------|-------------------------|
| S5: Engineering | |
| S5-1 | Vehicle Test Procedures |

| | |
|---|---|
| S6: Telemetry and Communications | |
| S6-1 | Telemetry Test Tape |
| S6-2 | End to End Link Test Tape |
| S6-3 | Recorded Vehicle Telemetry (Test, Pre-Launch, Launch) |

AS BUILT CONFIGURATION LIST

DESCRIPTION/PURPOSE:

A document describing the as-built configuration of each LV. This will be included with the traveler and will also include any Limited Life Items data sheet.

DATA REQUIREMENTS:

This will be a standard vehicle traveler and will also include any Limited Life Items data sheet.

DATA REQUIREMENT DESCRIPTION

Number: S4-1

MISSION BATTERY BUDGET ANALYSIS

DESCRIPTION/PURPOSE:

This analysis verifies sufficient energy and peak load margin exists to satisfy both vehicle and payload requirements.

DATA REQUIREMENTS:

Contractor formats acceptable.

DATA REQUIREMENT DESCRIPTION

Number: S4-2

EED's COMPATIBILITY ANALYSIS

DESCRIPTION/PURPOSE:

This analysis verifies the payload and LV ordnance will not be unintentionally triggered by the electromagnetic environment around and generated by the integrated payload/LV.

DATA REQUIREMENTS:

Contractor formats acceptable.

DATA REQUIREMENT DESCRIPTION

Number: S6-1

TELEMETRY TEST TAPE

DESCRIPTION/PURPOSE:

To provide raw telemetry signals, on magnetic tape or electronic medium, that are representative of the LV's telemetry allowing NASA to process, display and verify LV telemetry prior to LV testing.

DATA REQUIREMENTS:

Provide as a minimum:

- (A) Magnetic test tape and/or electronic copy representative of the telemetry signals of the launch vehicle.
- (B) Data on the magnetic tape and/or electronic copy shall be time correlated in a manner that enables time synchronization of all telemetry data and must conform to IRIG Standard 106-99.

DATA REQUIREMENT DESCRIPTION

Number: S6-2

END TO END LINK TEST PLAN

DESCRIPTION/PURPOSE:

To provide a test plan that verifies the telemetry (RF and hardwire), voice communication channels and video links from the Contractor's site to NASA's ground telemetry station. The plan will test NASA's ability to receive process, display and verify telemetry, voice communication channels and video from the Contractor's site prior to launch vehicle testing.

DATA REQUIREMENTS:

The end-to-end link test plan shall address how the Contractor will test all links from the Contractor's site to NASA's ground telemetry station. The plan shall address scope; organizations involved and points of contact for each; facilities used and/or involved; detailed information on telemetry signals, voice communication channels and video sources and transmission rates.

Attachment D4

Small business

VOLUME 4
CONTRACT

ATTACHMENT D4
SMALL BUSINESS AND SMALL
DISADVANTAGED BUSINESS
SUBCONTRACTING PLAN

ATTACHMENT D4

SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN

SpaceX qualifies as a small business concern; accordingly, it is not required by law to implement a small business and small disadvantage business subcontracting plan.

Attachment D-5

System Safety

VOLUME 4
CONTRACT

ATTACHMENT D5
SYSTEM SAFETY PROGRAM PLAN



SYSTEM SAFETY PROGRAM PLAN

For the

Falcon 1 and 9 Launch Vehicle Systems

**Revision 0
DRAFT**

SPACEX

May, 2007

Space Exploration Technologies Inc
1310 Grand Ave
El Segundo, CA 90245

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**Falcon Launch Vehicle
System Safety Program Plan**

Approved By:

Tim Buzza, Vice President, Launch and Test Operations, SpaceX

Approved By:

TBD, SpaceX System Safety Manager

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Change Summary

| Document Revision | Paragraph/Section /Figure | Description of Change |
|-------------------|------------------------------|---|
| Revision 0 | All | Initial release of Falcon 1 and Falcon 9 version |
| | | |
| | | |
| | | |
| | | |

1 Program Scope and Objectives

This plan establishes the safety organizational relationships, responsibilities, management and engineering requirements to assure a comprehensive hazard assessment for the life cycle of the Falcon 1 and 9 Launch Vehicle systems. Safety management and engineering will be integrated with the overall Falcon Launch Vehicle program activities involving system design, integration, test, transportation, launch activities, ground support, facilities and property, and the environment.

The purpose of the Falcon Launch Vehicle SSPP is to provide a description of the tasks and activities of safety management and safety engineering required to identify, evaluate, and eliminate or control hazards throughout the Falcon 1 and 9 Launch Vehicle lifecycles. This document will provide the basis of understanding between SpaceX, all subcontractors, and the launch range as to how the safety effort will be accomplished to meet the technical and operational safety requirements for the Falcon Launch Vehicle. This document will be submitted to all Launch Ranges considered for use, including Western Range and Eastern Range.

This document will describe the four elements of an effective system safety program that is being implemented at Space Exploration Technologies:

- A planned approach for task accomplishment,
- Qualified people to accomplish tasks,
- Authority to implement tasks through all levels of management, and
- Appropriate commitment of resources to assure tasks are completed.

1.1 Scope and Objectives

This System Safety Program Plan outlines the detailed requirements and methods of implementation of a comprehensive system safety program as outlined in MIL-STD 882C, EWR 127-1 (as tailored), and AFSPCMAN 91-710 (as tailored). This program will ensure that proper emphasis is placed on meeting system safety objectives, ensure compliance with safety requirements, and enforce controls to identify, eliminate, and/or control hazards, and to minimize their impact on personnel and equipment. Falcon Launch Vehicle program management is committed to meeting all OSHA, DoD, and Range Safety requirements to assure the highest practical level of safety. This document will be submitted to all Launch Ranges considered for use, including Western Range and Eastern Range.

The objectives of this safety plan are:

- Thoroughly document goals and criteria for the safety of personnel and the prevention of damage to the Falcon 1 or 9 Launch Vehicle, payload, ground support equipment, launch and range facilities and property, and the environment are established, implemented, and reviewed throughout the life cycle of the Launch Vehicle system.

- To oversee and assure implementation of those safety and hazard control tasks necessary to ensure full consideration of the safety goals and requirements throughout all phases of the program.
- Assure hazards are identified as early as possible in the design phase of the Launch Vehicle program.
- Assure appropriate actions are taken in a timely manner to eliminate or reduce the safety risks associated with the identified hazards, reducing them to a level acceptable to Range Safety.
- To report, document, and investigate all mishaps and to develop and implement corrective action plans and lessons learned in accordance with EWR 127-1 requirements and/or AFSPCMAN 91-710 requirements.

The ultimate purpose of this safety program is to:

- Identify program systems safety requirements and define responsibility for implementing these requirements.
- Focus management and engineering attention to the safety and hazard control aspects of the system.
- Ensure a disciplined approach to methodically control safety aspects, identify hazards, and prescribe and implement timely and effective corrective action.
- Ensure that the safety program is fully integrated with the design, engineering fabrication and test processes, and launch activities.
- Ensure that the effectiveness of the program is under continuous surveillance and evaluation.

1.2 System Safety Program Plan Updates

The SSPP will be updated whenever necessary, or every two years whichever is sooner, to reflect any changes to the Falcon Launch Vehicle Safety Program. SSPP updates will follow the same approval protocol as the original document.

1.3 Applicable Documents and Standards

| | |
|-----------------|--|
| EWR 127-1 | Eastern/Western Range Safety Regulations |
| AFSPCMAN 91-710 | Range Safety User Requirements Manual |
| MIL-STD-882C | Military Standard System Safety Program Requirements, 19 January 1993 |
| 29 CFR 1910 | Code of Federal Regulations, General Industry |

**Attachment D5: System Safety Program Plan, Pages
7-20, redacted in their entirety, pursuant to
Exemption 4**

APPENDIX A: Glossary Of Terms

| | |
|------------------------|--|
| 29 CFR 1910 | Code of Federal Regulations, General Industry |
| ADACS | Attitude Determination and Control Subsystem |
| AFSPCMAN 91-710 | Air Force Space Command Regulation 91-710 |
| AGE | Aerospace Ground Equipment |
| ARAR | Accident Risk Assessment Report |
| C&DH | Command & Data Handling |
| CCAFS | Cape Canaveral Air Force Station |
| DR | Design Review |
| EGSE | Electrical Ground Support Equipment |
| ER | Eastern Range |
| ESM | Equipment Support Module |
| EWR 127-1 | Eastern and Western Range 127-1 |
| FASM | Facility Safety Manager |
| FFDP | Final Flight Data Package |
| FRR | Flight Readiness Review |
| FSM | Flight Safety Manager |
| GOP | Ground Operations Plan |
| GSE | Ground Support Equipment |
| IMU | Inertial Measuring Unit |
| LRR | Launch Readiness Review |
| MSPSP | Missile System Prelaunch Safety Package |
| O&SHA | Operating and Support Hazard Analysis |
| OHA | Operations Hazard Analyses |
| OSHA | Occupational Safety and Health Administration |
| OSM | Operations Safety Manager |
| PFDP | Preliminary Flight Data Package |
| PHA | Preliminary Hazard Analysis |
| RSSR | Range Safety System Report |
| SDP | Safety Data Package |

| | |
|-------------|-----------------------------------|
| SHA | System Hazard Analysis |
| SSHA | Subsystem Hazard Analysis |
| SSM | System Safety Manager |
| SSPP | System Safety Program Plan |
| VAFB | Vandenberg Air Force Base |
| VTL | Verification Tracking Log |

VOLUME 4
CONTRACT

ATTACHMENT D5
SPACEX SAFETY AND HEALTH
MANUAL

SPACEX

SAFETY POLICY

AND

PROCEDURES MANUAL

A.K.A.: IIPP
(INJURY & ILLNESS PREVENTION PROGRAM)

JULY 2003

(REVISED)

DEVELOPED BY:

AMERICAN SAFETY INSTITUTE
(800) 570-7233

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SPACEX

SAFETY POLICIES AND PROCEDURES

FOREWORD

This manual has been developed for the protection of all employees and to help keep **SPACEX** free of accidents and injuries. It can only serve the company if it is used. Each supervisor is required to read it through and sign the form on the next page and return it to the Safety Coordinator.

This manual has been developed to meet the safety requirements outlined in the CAL/OSHA General Industry Safety Orders, which incorporates the requirements of Section 3203 "Accident Prevention Plan", and the safety program requirements under SB198.

Set forth in this manual is a set of instructive safety rules and procedures for you to use to enhance safety performance on your job. It covers many fundamentals of accident prevention, but no single manual can be complete, and from time to time new rules or revised rules may become necessary. These new rules or revisions will be issued to you to insert into this manual.

If you have any questions, ask your immediate superior or the Safety Coordinator for assistance. Failure to comply with the safety rules or policies may result in disciplinary action or possible discharge from your job.

It is important that all members of management provide the leadership necessary to comply with safety requirements willingly and "set a good example for all employees". Believe that safety serves your best interests.

If you have any questions, voice them at the right time and place, but don't hamper the program by complaining and balking when it only will do harm. More than anything else, safety is an attitude. The most effective training for all concerned is the day to day example we set for one another.

**SAFETY POLICIES
AND
PROCEDURES MANUAL**

**SUPERVISOR'S
ACKNOWLEDGMENT OF RECEIPT**

I acknowledge receipt of the **SAFETY POLICIES AND PROCEDURES MANUAL**.

As a condition of continued employment I agree to read and study this manual in order to acquaint myself with these rules and regulations and to follow them to the best of my ability.

Signature (Supervisor)

Date

Please print your name above.

PROGRAM OBJECTIVES

The success of the company's **SAFETY AND HEALTH PROGRAM** depends on the sincere, constant, and cooperative effort of all Plan officials, management, and employees. Their active participation and support of the safety program and implementation of its procedures will make it a success.

Annual review:

The following objectives and goals have been established to gauge the success of our program, as a minimum guideline, and will be reviewed annually by the Safety Coordinator to evaluate the Plan's safety performance:

Objectives:

1. To provide a safety and health program consistent with good operating practices and maintain compliance with applicable safety and health regulations, and in particular, CAL/OSHA Section 3203 and the requirements of SB198.
2. To create an attitude of safety consciousness in management, supervision, and employees: We will establish a spirit of cooperation and teamwork throughout all operations regarding all health and safety matters.

In order to accomplish these objectives, our safety program will include:

1. Preplanning for safety in every portion of the operation through the active cooperation and participation of management personnel. We will draw upon their experience and expertise to anticipate and mitigate or eliminate accident producing situations.
2. Provide mechanical and physical safeguards to the maximum extent possible in compliance with government regulations, i.e., State or Federal OSHA, Fire Codes, etc.
3. Conduct a program of safety and health inspections to discover and correct unsafe working conditions or practices; to control health hazards; and to comply fully with the safety and health standards for each job, operation, and facility.
4. Training for all employees on good safety and health practices.
5. Providing the necessary personal protective equipment and instructions for its use and care.
6. Developing and enforcing safety and health rules and requiring all employees to cooperate with these rules as a condition of employment.
7. Investigating every accident promptly to find its cause and correcting the problem in order to prevent recurrence.

Limitations:

The use and intent of this manual is as a **guideline only**. All operations are not the same, and the policies and procedures set forth in this manual need to be tailored to the specific operations and characteristics of each operation. The successful implementation of this manual will largely depend on the enthusiasm and common sense of each supervisor and coordinator.

**Attachment D5: SpaceX Safety and Health Manual,
Pages 5-277, redacted in their entirety, pursuant to
Exemption 4 (Copyright)**

VOLUME 4
CONTRACT

ATTACHMENT D6
RELIABILITY PLAN FOR FALCON 1

Attachment D6

Reliability Plan For The Falcon 1 Launcher.

SPACE



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1 Scope

1.1 Purpose

This document describes the procedures, processes, and analytical approaches SpaceX implemented in the design and development of Falcon 1 launch vehicle. In addition, this document also includes a plan describing the process employed to achieve and maintain a flight reliability of 95% or greater with a confidence, that is a demonstrated certainty, of 80%. NASA-STD-8729.1 was used as a guideline along with NASA Policy Directive 8720.1B to develop the process control and quality assurance tasking outlined in this

reliability plan to achieve the design reliability on the fielded launcher and maintaining it throughout production.

1.2 Applicability

The tasks described in this plan are applicable to all Falcon 1 systems, subsystems, and components included in the Falcon 1 design.

1.2.1 Tailoring of Tasks

The tasks included in this plan are consistent with the requirements listed in NASA-STD-8729.1 (dated December 1998), but they have been tailored to the specific processes and procedures extant at SpaceX. In all cases the delineated tasks fulfill the intent of the NASA request and that of the NASA-STD-8729.1. This tailoring is consistent with the guidance given in the NASA standard, which emphasizes the movement away from rigid standards and toward flexible guidelines. It is also consistent with the government's increased willingness to accept mature, controlled commercial practices and to seek industry solutions in civil and military systems. The specific methods that SpaceX employs in fulfilling these requirements are listed in the paragraphs that follow. In each case SpaceX has taken care to add, modify, or delete requirements that are considered inconsistent with the Falcon 1 program needs and the processes and procedures that SpaceX considers essential to the production and fielding of a Falcon 1 launch vehicle consistent with the reliability levels specified by NASA.

2 Reference Documents

The following documents are referenced in this plan and are applicable as referenced:

NASA Standards:

NASA-STD-8729.1 Planning, Developing and Managing an Effective Reliability and Maintainability (R&M) Program, December 1998

NASA NPD 8720.1B NASA Reliability and Maintainability (R&M) Program Policy, 28 April 2004

NPD 8700.1B, NASA Policy for Safety and Mission Success, Revalidated 4/28/04

NASA Facility Safety Requirements

NASA-STD-8739.8, w/ Change 1, Software Assurance Standard, July 28, 2004

Military Standards:

MIL-STD-785 Reliability Program for Systems and Equipment Development and Production.

MIL-STD-781 Definitions of Terms for Reliability and Maintainability

MIL STD 1540C Test Requirements for Launch & Space Vehicles

SpaceX Documents

SpaceX Quality Manual

3 Terms, Definitions, and Acronyms

Allocation - The assignment of reliability (or maintainability) performance requirements to subsystems and elements within a system which will result in meeting the overall reliability (or maintainability) performance requirements for the system if each of these performance requirements is attained.

Architecture - A structure that shows the elements and their relationship for a set of requirements or a system concept or both.

Assembly - A hardware item composed of any number of parts or subassemblies, joined together to perform a specific function, which can be disassembled without destruction.

Assessment - An evaluation or appraisal of the state of a system, program/project or a portion of a program/project.

Availability - The probability that an item will be in an operable and committable state at the start of a mission when the mission is called for at a random time.

Built-In Test (BIT) - A test approach using self test hardware or software to test all or part of an equipment item or system. BIT denotes any self-test feature incorporated into a design for the purpose of detecting, diagnosing and isolating failures.

Compatibility - The capability of two or more items to exist or function in the same system or environment without mutual interference.

Component - An assembly or any combination of parts, subassemblies, assemblies mounted together, such as a transmitter or cryogenic pump.

Constraints - Boundaries limiting design freedom which can be defined by environmental factors, contractual requirements, internal program/project requirements, or other factors. Environmental factors may include operating temperatures, pressure, levels of dust, etc. Contractual and internal design constraints may include interfaces, reliability, maintainability, human factors, logistics support, physical mass and dimensions, standardization, costs, design and fabrication practices, personnel resource and training.

Critical Item List - A list of items which, because of special engineering or logistic considerations, requires an approved specification to establish technical or inventory control at the component level.

Criticality (of a failure) - A measure of the severity of a failure in relation to mission performance, hazards to material or personnel, and maintenance cost. Programs/projects typically establish their own criticality definitions and classifications.

Degradation - A gradual impairment in ability to perform one or more functions.

Design Constraints - Boundaries limiting design freedom which can be defined by environmental factors, contractual requirements, internal program/project requirements, or other factors. Environmental factors may include operating temperatures, pressure, levels of dust, etc. Contractual and internal design constraints may include interfaces, reliability, maintainability, human factors, logistics support, physical mass and dimensions, standardization, costs, design and fabrication practices, personnel resource and training

Environment - The natural and induced conditions experienced by a system including its people, processes, and products during operational use, stand-by, maintenance, transportation, and storage.

Failure - An incident in which an item does not perform an intended function.

Failure Mode - The characteristic manner in which a failure occurs, independent of the reason for failure; the condition or state which is the end result of a particular failure mechanism; the consequence of the failure mechanism through which the failure occurs, i.e., short, open, fracture, excessive wear.

Failure Modes and Effects Analysis (FMEA) - Analysis of a system and the working interrelationships of its elements to determine ways in which failures can occur (failure modes) and the effects of each potential failure on the system element in which it occurs, on other system elements, and on the mission.

Failure Mode Effects and Criticality Analysis (FMECA) - Analysis of a system and the working interrelationships of its elements to determine ways in which failures can occur (failure modes) and the effects of each potential failure on the system element in which it occurs, on other system elements, and on the mission, and the study of the relative mission significance or criticality of all potential failure modes.

Fault Isolation - The process of determining the approximate location of a fault.

Fault Tree Analysis - A deductive system reliability tool which provides both qualitative and quantitative measures of the probability of failure. It estimates the probability that a top level event will occur, systematically identifies all possible causes leading to the top event, and documents the analytic process to provide a baseline for future studies of alternative designs.

Hardware - Items made of a material substance but excluding computer software and technical documentation.

Life Cycle Cost - The total cost of acquisition, operation, maintenance, and support of an item throughout its useful life, and including the cost of disposal.

Maintenance - All actions necessary for retaining an item in, or restoring it to, a specified condition.

Mean-Time-Between-Failures (MTBF) - A basic measure of reliability for repairable systems, MTBF is the mean number of life units during which all parts of the system perform within their specified limits, during a particular measurement interval, under stated conditions. - The mean of the distributions of the time interval between failures.

Milestone - Any significant event in the program/project life cycle or in the associated reliability or maintainability program which is used as a control point for measurement of progress and effectiveness or for planning or redirecting future effort.

Mission Critical - An item or function, the failure of which may result in the inability to retain operational capability for mission continuation if a corrective action is not successfully performed.

Mission Profile - A time phased description of the events and environments an item experiences from initiation to completion of a specified mission, to include the criteria of mission success or critical failures. Mission Profiles are used in establishing general performance requirements and are essential to evaluate R&M performance. They should include functional and environmental profiles that define the boundaries of the R&M performance envelope, provide the timelines typical of operations within the envelope, and identify all constraints where appropriate.

Operational Readiness - The ability of a system to respond and perform its mission upon demand.

Part - One piece, or two or more pieces joined together, which cannot be disassembled without destruction or loss of design use

Performance - A measure of how well a system or item functions in the expected environments.

Procedure - A documented description of a sequence of actions to be taken to perform a given task.

Redundancy (of design) - A design feature which provides a system with more than one function for accomplishing a given task so that more than one function must fail before the system fails to perform the task. Design redundancy requires that a failure in one function does not impair the system's ability to transfer to a second function.

Reliability - The probability that an item will perform its intended function for a specified interval under stated conditions. The function of an item may be composed of a combination of individual sub-functions to which the top level reliability value can be apportioned.

Reliability Analyses - A set of conceptual tools and activities used in reliability engineering.

Reliability Prediction - A forecast of the reliability of a system or system element, postulated on analysis, past experience, and tests.

Requirements - A set of characteristics or distinguishing features that is obligatory or a necessity. In engineering, requirements are established to meet operational needs and comply with applicable policy and practices.

Review - A critical examination of a task or program/project to determine compliance with requirements and objectives.

Risk - A combination of the likelihood of an undesirable event occurring and the severity of the consequences of the occurrence.

Risk Acceptance - The act by a decision maker of accepting a risk because the benefits outweigh the perceived risk.

Risk Assessment, Probabilistic - An evaluation of a risk item which determines (1) what can go wrong, (2) how likely is it to occur, and (3) what are the consequences. Assessment methods include:

Simulation - The process of conducting experiments with a model (an abstraction or simplification) of an item, within all or part of its operating environment, for the purpose of accessing its behavior under selected conditions or of evaluating various strategies for its operation within the limits imposed by developmental or operational criteria.

Single Failure Point - A single element of hardware, the failure of which would result in loss of mission objectives, system function, hardware, or crew as defined for the specific application or program/project.

Spares - Maintenance replacements for parts, components, or assemblies in deployed items of equipment.

Stress Screening - The process of applying mechanical, electrical, or thermal stresses to an Equipment item for the purpose of precipitating latent part and workmanship defects to early failure.

Subsystem - A grouping of items satisfying a logical group of functions within a system.

Supplier - Any organization which provides a product or service to a *customer*. By this definition, suppliers may include vendors, subcontractors, contractors, flight programs/projects, and the NASA organization supplying science data to a principal investigator. (In contrast, the classical definition of a supplier is: a subcontractor, at any tier, performing contract services or producing the contract articles for a contractor.)

System - An integrated aggregation of end items, interfaces, and support functions designed to fulfill a specific mission requirement. A system may include equipment, trained personnel, facilities, data and procedures, and software. For program/project purposes, a system is typically defined as the highest level of hardware organization composed of multiple subsystems. The term is also used to describe a disciplined and consistent approach to accomplish a task, e.g., a failure reporting system.

Tailoring - To make, alter, or amend for a particular end or purpose. In performance-based contracting, the process by which sections, paragraphs, and sentences of specifications, standards, and other requirements and tasking documents are evaluated to determine the extent to which they are applicable to a specific acquisition contract and then modified to balance performance, cost, schedule, and risk.

Task - A function to be performed. In contract proposals, a unit of work that is sufficiently well defined so that, within the context of related tasks, readiness criteria, completion criteria, cost and schedule can all be determined.

Test - A procedure for critical evaluation: a means of determining the presence, quality, or truth of something; a trial. In engineering, a method of determining performance by exercising or operating a system or item using instrumentation or special test equipment that is not an integral part of the item being tested.

**Attachment D6: Reliability Plan for Falcon 1
Launcher, Pages 9-27, redacted in their entirety,
pursuant Exemption 4**

VOLUME 4
CONTRACT

ATTACHMENT D6
RELIABILITY PLAN FOR FALCON 9

Attachment D6

Reliability Plan For The Falcon 9 Launcher

SPACEX



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1 Scope

1.1 Purpose

This document describes the procedures, processes, and analytical approaches SpaceX implemented in the design and development of Falcon 9 launch vehicle. In addition, this document also includes a plan describing the process employed to achieve and maintain a flight reliability of 95% or greater with a confidence, that is a demonstrated certainty, of 80%. NASA-STD-8729.1 was used as a guideline along with NASA Policy Directive 8720.1B to develop the process control and quality assurance tasking outlined in this reliability plan to achieve the design reliability on the fielded launcher and maintaining it throughout production.

1.2 Applicability

The tasks described in this plan are applicable to all Falcon 9 systems, subsystems, and components included in the Falcon 9 design.

1.2.1 Tailoring of Tasks

The tasks included in this plan are consistent with the requirements listed in NASA-STD-8729.1 (dated December 1998), but they have been tailored to the specific processes and procedures extant at SpaceX. In all cases the delineated tasks fulfill the intent of the NASA request and that of the NASA-STD-8729.1. This tailoring is consistent with the guidance given in the NASA standard, which emphasizes the movement away from rigid standards and toward flexible guidelines. It is also consistent with the government's increased willingness to accept mature, controlled commercial practices and to seek industry solutions in civil and military systems. The specific methods that SpaceX employs in fulfilling these requirements are listed in the paragraphs that follow. In each case SpaceX has taken care to add, modify, or delete requirements that are considered inconsistent with the Falcon 9 program needs and the processes and procedures that SpaceX considers essential to the production and fielding of a Falcon 9 launch vehicle consistent with the reliability levels specified by NASA.

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SpaceX Documents

SpaceX Quality Manual

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Hardware - Items made of a material substance but excluding computer software and technical documentation.

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Mission Critical - An item or function, the failure of which may result in the inability to retain operational capability for mission continuation if a corrective action is not successfully performed.

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Reliability - The probability that an item will perform its intended function for a specified interval under stated conditions. The function of an item may be composed of a combination of individual sub-functions to which the top level reliability value can be apportioned.

Reliability Analyses - A set of conceptual tools and activities used in reliability engineering.

Reliability Prediction - A forecast of the reliability of a system or system element, postulated on analysis, past experience, and tests.

Requirements - A set of characteristics or distinguishing features that is obligatory or a necessity. In engineering, requirements are established to meet operational needs and comply with applicable policy and practices.

Review - A critical examination of a task or program/project to determine compliance with requirements and objectives.

Risk - A combination of the likelihood of an undesirable event occurring and the severity of the consequences of the occurrence.

Risk Acceptance - The act by a decision maker of accepting a risk because the benefits outweigh the perceived risk.

Risk Assessment, Probabilistic - An evaluation of a risk item which determines (1) what can go wrong, (2) how likely is it to occur, and (3) what are the consequences. Assessment methods include:

Simulation - The process of conducting experiments with a model (an abstraction or simplification) of an item, within all or part of its operating environment, for the purpose of accessing its behavior under selected conditions or of evaluating various strategies for its operation within the limits imposed by developmental or operational criteria.

Single Failure Point - A single element of hardware, the failure of which would result in loss of mission objectives, system function, hardware, or crew as defined for the specific application or program/project.

Spares - Maintenance replacements for parts, components, or assemblies in deployed items of equipment.

Stress Screening - The process of applying mechanical, electrical, or thermal stresses to an Equipment item for the purpose of precipitating latent part and workmanship defects to early failure.

Subsystem - A grouping of items satisfying a logical group of functions within a system.

Supplier - Any organization which provides a product or service to a *customer*. By this definition, suppliers may include vendors, subcontractors, contractors, flight programs/projects, and the NASA organization supplying science data to a principal investigator. (In contrast, the classical definition of a supplier is: a subcontractor, at any tier, performing contract services or producing the contract articles for a contractor.)

System - An integrated aggregation of end items, interfaces, and support functions designed to fulfill a specific mission requirement. A system may include equipment, trained personnel, facilities, data and procedures, and software. For program/project purposes, a system is typically defined as the highest level of hardware organization composed of multiple subsystems. The term is also used to describe a disciplined and consistent approach to accomplish a task, e.g., a failure reporting system.

Tailoring - To make, alter, or amend for a particular end or purpose. In performance-based contracting, the process by which sections, paragraphs, and sentences of specifications, standards, and other requirements and tasking documents are evaluated to determine the extent to which they are applicable to a

specific acquisition contract and then modified to balance performance, cost, schedule, and risk.

Task - A function to be performed. In contract proposals, a unit of work that is sufficiently well defined so that, within the context of related tasks, readiness criteria, completion criteria, cost and schedule can all be determined.

Test - A procedure for critical evaluation; a means of determining the presence, quality, or truth of something; a trial. In engineering, a method of determining performance by exercising or operating a system or item using instrumentation or special test equipment that is not an integral part of the item being tested.

Troubleshooting - A procedure for localizing and diagnosing equipment malfunctions or anomalies, typically by a systematic examination progressing from higher to lower levels of assembly.

Validation- To establish the soundness of, or to corroborate. Validation testing of products is performed to ensure that each reflects an accurate interpretation and execution of requirements and meets a level of functionality and performance that is acceptable to the user or customer.

Verification - The task of determining whether a system or item meets the requirements established for it.

**Attachment D6: Reliability Plan for Falcon 9
Launcher, Pages 8-30, redacted in their entirety,
pursuant Exemption 4**

**Attachment D6: Reliability Evaluation for Falcon 1,
Pages i-21, redacted in their entirety, pursuant
Exemption 4**

**Attachment D6: Reliability Evaluation Appendices,
Pages Appendices (all), redacted in their entirety,
pursuant to Exemptions 3 and 4**

VOLUME 4
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ATTACHMENT D6
RELIABILITY EVALUATION OF
FALCON 9

**RELIABILITY EVALUATION OF SPACE EXPLORATION
TECHNOLOGIES (SPACEX) FALCON 9 PAYLOAD LAUNCH
VEHICLE**

prepared for

SPACE EXPLORATION TECHNOLOGIES

Purchase Order No. 14048 / Task Order No. 7

Report No. 0629602.07-01

Revision 0

July 2007

prepared by

ARES CORPORATION

1331 Gemini, Suite 120

Houston, Texas 77058

Space Exploration Technologies Company Proprietary Information
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**Attachment D6: Reliability Evaluation of Falcon 9,
Pages i-21, redacted in their entirety, pursuant to
Exemption 4**

**Attachment D6: Reliability Evaluation of Falcon 9,
Appendices, Pages A-1 – B-107, redacted in their
entirety, pursuant to Exemptions 3 and 4**

Attachment D7

Quality MANUAL

VOLUME 4
CONTRACT

ATTACHMENT D7
QUALITY MANUAL

SPACEX



Quality Manual

Rev. G

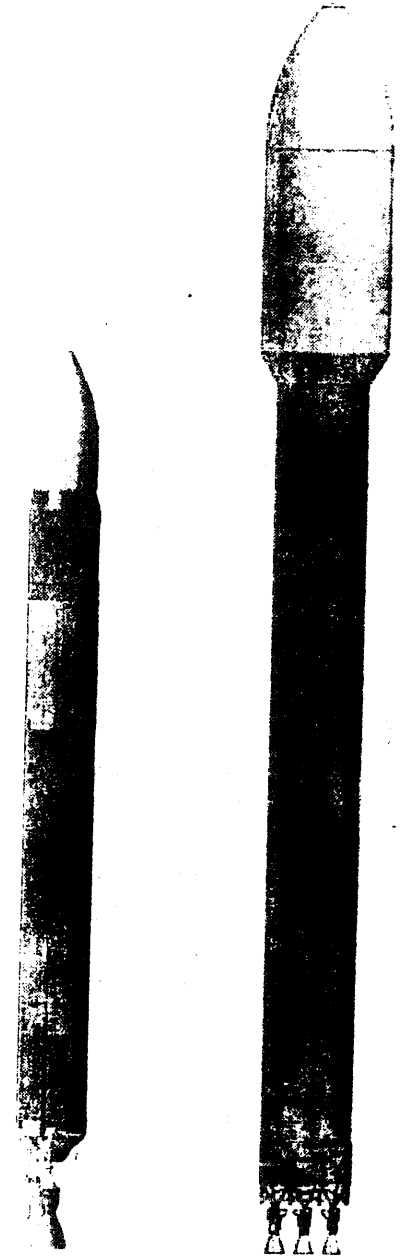
September 2007

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SPACEX

QUALITY MANUAL
Revision G, September 2007

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QUALITY MANUAL
Revision G, September 2007

1.0 Welcome to Space Explorations Technology Corp.

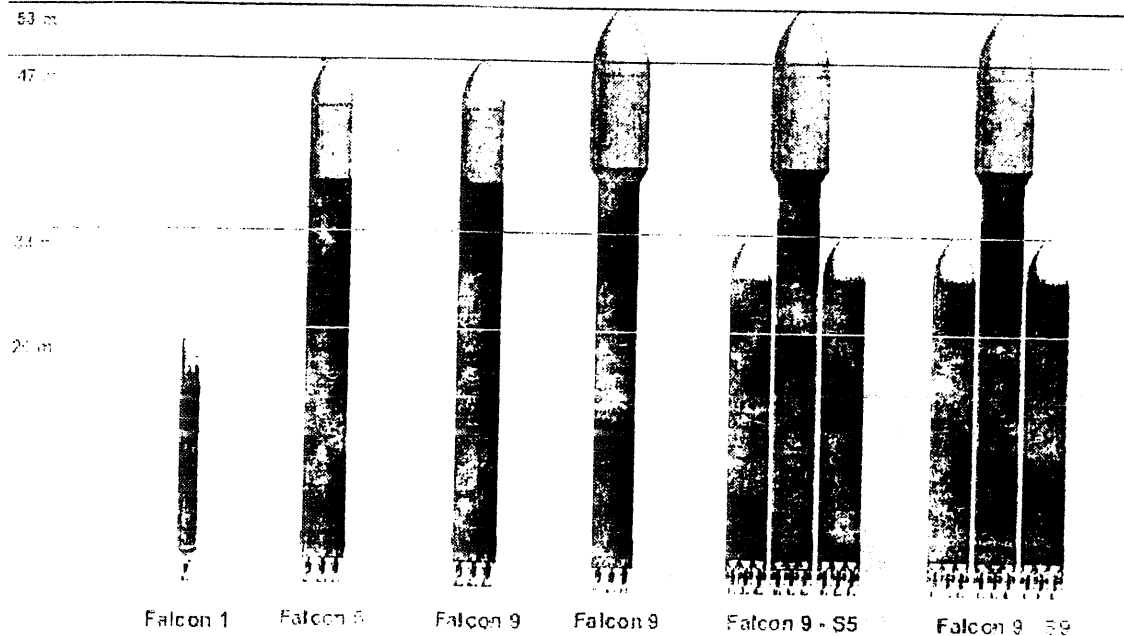
1.1 Our Mission

SpaceX is building the Falcon family of launch vehicles, intended to reduce the cost and increase the reliability of access to space ultimately by a factor of ten.

With the Falcon 1, Falcon 5 and Falcon 9 launch vehicles, SpaceX is able to offer light, medium and heavy lift capabilities. We are able to deliver spacecraft into any inclination and altitude, from low Earth orbit to geosynchronous orbit to planetary missions.

Our medium and heavy lift vehicles, Falcon 5 and Falcon 9, are the only US launch vehicles with true engine out reliability. Falcon 5 and 9 are also designed such that both stages are reusable, making them the world's first fully reusable launch vehicles. Falcon 1 has a reusable first stage and expendable upper stage.

Although drawing upon a rich history of prior launch vehicle and engine programs, SpaceX is privately developing the Falcon rockets from the ground up, including main and upper stage engines, the cryogenic tank structure, avionics, guidance & control software and ground support equipment. SpaceX also does selective government development where necessary to adapt our technology to specific government needs.



SPACEX

QUALITY MANUAL
Revision G, September 2007

1.2 Our History

SpaceX was founded in 2002 with the singular, focused goal of reducing the cost and improving the reliability of access to space, initially for satellites and later for people. In 2005, we completed development of the Falcon 1 launch vehicle, a light class launch vehicle with half a ton to orbit capability, which saw its maiden flight in early 2006.

Development of the Falcon 9, a medium to heavy class launch vehicle that can place up to 25 tons in orbit, began in 2005 and we expect it to see first flight in late 2007.

Our launch vehicles are the lowest cost in the world, selling for less than a quarter of our US competitors. Even prior to launch, we secured launch contracts from US and foreign governments, as well as domestic and international commercial firms.

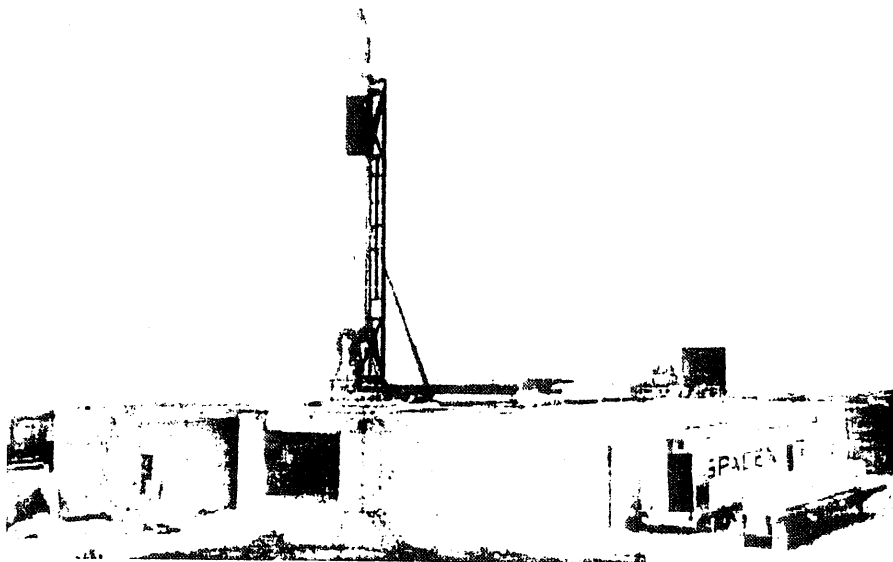
1.3 Our Organization

The SpaceX design and manufacturing facilities are located in Southern California, near the Los Angeles airport, and our propulsion development and structural test facilities are located in Central Texas.

SpaceX utilizes third party launch sites located throughout the world, including Vandenberg Air Force Base in California and Kwajalein Atoll, Marshall Islands. We are in process of establishing a site at Cape Canaveral.

The management and support staff organization chart is shown on the next page.

Details on responsibilities are defined within the subsequent sections of this manual. In all cases, the CEO and President have granted both the responsibility and authority to each position within the company.



**Attachment D7: Quality Manual, Pages 4-74,
redacted in their entirety, pursuant to Exemption 4**

Attachment D 8

Work Plan.

**Attachment D8: Work Plan, Pages ALL, redacted
pursuant to Exemption 4**

Attachment D-9

Most Favored

VOLUME 4
CONTRACT

ATTACHMENT D9
MOST FAVORED CUSTOMER
CERTIFICATION PLAN

ATTACHMENT D9

MOST FAVORED CUSTOMER CERTIFICATION PLAN

Pursuant to Section B, Clause 4.0, SpaceX agrees to certify that the CLIN prices for standard launch services (including standard mission integration) under this contract are no higher than the lowest price charged to any other commercial or U.S. Government customer for an equivalent launch service during the twelve (12) months both preceding and following contract award, or placement of a launch service task order. The contract further states that the Government shall be entitled to a one-time reduction in contract price for each standard launch service failing to meet this certification. The price credit will be equal to the difference between the standard launch service price under this contract and the lower price awarded for an equivalent launch service.

As a general matter, it is SpaceX's standard commercial contracting practice with both its commercial and U.S. Government customers to execute firm, fixed-price contracts for launch services. Critically, SpaceX publishes its standard launch services pricing on the company website. In this way, NASA can readily be aware of the company's general pricing.

Separately, SpaceX will validate compliance and enforcement of the Most Favored Customer certification set forth in Section B, Clause 4.0 by taking the following actions:

- (1) Upon NASA's contract award or NASA's placement of a launch service task order under this contract, SpaceX shall review each of the company's pending contracts for the provision of launch services executed at any point during the twelve preceding months with any commercial or U.S. Government customer to determine whether an equivalent launch service is provided. In the event that SpaceX determines that an equivalent launch service is not provided, SpaceX shall provide to NASA a detailed description of the rationale for this determination for review, subject to the terms of nondisclosure agreements with the third party purchaser and NASA and without providing the name of the third party or express contractual terms. In the event that SpaceX determines that an equivalent launch service is provided, SpaceX shall review the contract pricing and provide NASA with a certified description of the pricing, subject to the terms of nondisclosure agreements with the third party purchaser and NASA and without providing the name of the third party or the express contractual terms. Subject to further review and mutual agreement by the Parties, NASA shall be entitled to a one-time reduction in contract price for any purchase higher than the lowest price charged by SpaceX to any other commercial or U.S. Government

customer for an equivalent launch service during the preceding twelve (12) months before contract award or placement of a launch service task order;

- (2) Twelve months after NASA's contract award or NASA's placement of a launch service task order under this contract, SpaceX shall review each of the company's contracts for the provision of launch services executed during the twelve subsequent months with any commercial or U.S. Government customer to determine whether an equivalent launch service is provided. In the event that SpaceX determines that an equivalent launch service is not provided, SpaceX shall provide to NASA a detailed description of the rationale for this determination for review, subject to the terms of nondisclosure agreements with the third party purchaser and NASA and without providing the name of the third party or express contractual terms. In the event that SpaceX determines that an equivalent launch service is provided, SpaceX shall review the contract pricing and provide NASA with a certified description of the pricing, subject to the terms of nondisclosure agreements with the third party purchaser and NASA and without providing the name of the third party or express contractual terms. Subject to further review and mutual agreement by the Parties, NASA shall be entitled to a one-time reduction in contract price for any purchase higher than the lowest price charged by SpaceX to any other commercial or U.S. Government customer for an equivalent launch service during the subsequent twelve (12) months after contract award or placement of a launch service task order.

Attachment D 10

Acronyms

VOLUME 4
CONTRACT

ATTACHMENT D10
ACRONYMS AND ABBREVIATIONS

ATTACHMENT D10

ACRONYMS AND ABBREVIATIONS

| | |
|----------------|---|
| A/R | As Required |
| ACS | Attitude Control System |
| AFSPCI | Air Force Space Command Instruction |
| AKM | Apogee Kick Motor |
| Alt. | Alternate |
| Amps | Amperes |
| ANSI | American National Standards Institute |
| AO | Announcement of Opportunity |
| ASCII | American Standard Code for Information Interchange |
| ASQC | American Society for Quality Control |
| ATM | Acceleration Transformation Matrix |
| ATP | Authority to Proceed |
| Attn. | Attention |
| ATTS | Automatic Thrust Termination System |
| AU | Astronomical Unit |
| AWG | American Wire Gauge |
| | |
| BVS | Best Value Solicitation |
| | |
| C | Centigrade |
| C ₃ | Earth escapes energy expressed in km ² /sec ² |
| CAGE | Commercial and Government Entity |
| CAIB | Columbia Accident Investigation Board |
| CBA | Collective Bargaining Agreement |
| CCAM | Collision/Contamination Avoidance Maneuver |
| CCAFS | Cape Canaveral Air Force Station |
| CDR | Critical Design Review |
| CDRL | Contract Data Requirements List |
| CFR | Code of Federal Regulations |
| CG | Center of Gravity |
| CLA | Coupled Loads Analysis |
| CLIN | Contract Line Item Number |
| CLSRB | Current Launch Schedule Review Board |

| | |
|--------|--|
| cm | Centimeter |
| COB | Close Of Business |
| COLA | Collision Avoidance |
| COPV | Two Composite Over-Wrapped Pressure Vessels |
| COTR | Contracting Officer's Technical Representative |
| CRD | Command Receive Decoder |
| CTTS | Command Thrust Termination System |
| CVCM | Collected Volatile Condensable Materials |
| CVS | Concurrent Version System |
| CY | Calendar Year |
| | |
| D | Day |
| dB | Decibel |
| dBm | Decibel Millivolts |
| DC | Direct Current |
| DD | Day |
| DE | Degree |
| DIG | Designated Industry Group |
| DLA | Declination of Launch Asymptote |
| DMR | Detailed Mission Requirements |
| DOD | Department Of Defense |
| DoDISS | DOD Index of Specifications and Standards |
| DoDSSP | DOD Single Stock Point |
| DOF | Degrees of Freedom |
| DPAS | Defense Priority Allocation System |
| DRD | Data Requirement Description |
| DRL | Data Requirement List |
| DS | Deep Space |
| DUNS | Data Universal Numbering System |
| | |
| E.O. | Equal Opportunity |
| EAR | Export Administration Regulations |
| EED | Electro Explosive Device |
| EEE | Electrical, Electronic and Electromechanical |
| EELV | Evolved Expendable Launch Vehicle |
| EFT | Electronic Funds Transfer |
| EIRP | Effective Isotropic Radiated Power |
| ELV | Expendable Launch Vehicle |

| | |
|----------|--|
| EMA | Electro Mechanical Actuator |
| EMC | Electromagnetic Compatibility |
| EMI | Electromagnetic Interference |
| EO | Engineering Order |
| EOS CHEM | Earth Observing System-Chemistry |
| EOS PM | Earth Observing System-Post Meridian |
| ER | Eastern Range |
| ERP | Enterprise Resource Planning |
| ESOH | Environmental Safety and Occupational Health |
| ETR | Eastern Test Range |
| EWR | Eastern/Western Range |
| | |
| F | Fahrenheit |
| FAA | Federal Aviation Administration |
| FAR | Federal Acquisition Regulation |
| FED-STD | Federal Standard |
| FEM | Finite Element Model |
| FFP | Firm-Fixed-Price |
| FMA | Final Mission Analysis |
| FMEA | |
| FPMR | Federal Procurement Material Record |
| FRB | Failure Review Board |
| FRGG | Turbopump-Fed Gas Generator |
| FRR | Flight Readiness Review |
| FS | Front Section |
| FSS | Flight Safety System |
| FTS | Flight Termination System |
| | |
| g | Acceleration of Gravity |
| G&A | General and Administrative |
| GAO | General Accounting Office |
| G/T | Gain-to-Noise Temperature |
| GFP | Government-Furnished Property |
| GHe | Gaseous Helium |
| GIDEP | Government/ Industries Data Exchange Program |
| GG | Gas Generator |
| GLOW | Gross Lift Off Weight |
| GN&C | Guidance Navigation and Control |

| | |
|-----------------|--|
| GN ₂ | Gaseous Nitrogen |
| Govt. | Government |
| GPS | Global Positioning System |
| GSA | General Services Administration |
| GSE | Ground Support Equipment |
| GSFC | Goddard Space Flight Center |
| GSO | GeoSynchronous Orbit |
| GTO | Geosynchronous Transfer Orbit |
| | |
| H/W | Hardware |
| HITL | Hardware in the Loop Simulator |
| Horiz | Horizontal |
| hrs | Hours |
| HT | Height |
| Hz | Hertz |
| | |
| I | Inertial |
| IACO | Integration Assembly and Checkout |
| ICD | Interface Control Document |
| ID | Identification |
| IDIQ | Indefinite Delivery/Indefinite Quantity |
| IFB | Invitation For Bid |
| IIV & V | Internal Independent Verification and Validation |
| IMP | Integrated Master Plan |
| IMS | Integrated Master Schedule |
| IMU | Inertial Measurement Unit |
| IR | Infrared |
| IRCA | International Registrar of Certified Auditors |
| IRIG | Inter-Range Instrumentation Group |
| IRS | Internal Revenue Service |
| IRT | Independent Review Team |
| ISO | International Organizations for Standardization |
| ITAR | International Traffic in Arms Regulations |
| IV & V | Independent Verification and Validation |
| | |
| JSC | Johnson Space Center |
| | |
| K2 | Kestrel 2 |

| | |
|-----------|---|
| kBit | Kilobit |
| kg | Kilogram |
| KHB | Kennedy Handbook |
| kHz | Kilohertz |
| km | Kilometer |
| KO | Kick Off |
| KSC | Kennedy Space Center |
| | |
| L | Launch |
| Lb | Pounds |
| LAT | Latitude |
| LCR | Launch Control Room |
| LEB | Launch Equipment Building |
| LEO | Low Earth Orbit |
| LHC | Left Hand Circular |
| LMCM | Launch Management Coordination Meeting |
| LON | Longitude |
| LOS | Loss of Signal |
| LOX | Liquid Oxygen |
| LRR | Launch Readiness Review |
| LSP | Launch Service Proposal |
| LSP | Launch Service Provider |
| LSPO | Launch Service Program Office |
| LSTO | Launch Service Task Order |
| LTM | Load Transformation Matrix |
| LV | Launch Vehicle |
| LVS | Launch Vehicle System |
| | |
| m | Meter |
| M | Month |
| M1 | Merlin 1 |
| MAB | Missile Assembly Building |
| MAV | Mars Ascent Vehicle |
| Max. | Maximum |
| MCB | Manifest Control Board |
| MDR | Mission Design Review |
| MECO | Main Engine Cut-Off |
| MESSENGER | Mercury Surface, Space Environment, Geochemistry, and Ranging Mission |

| | |
|---------|---|
| MFCO | Mission Flight Control Officer |
| MHz | Megahertz |
| MIL-PRF | Military Performance Specification |
| MIL-STD | Military Standard |
| min | Minute |
| MIR | Mission Implementation Review |
| MISTI | Miniature Space Technology Initiative |
| MM | Month |
| MOI | Moment of Inertia |
| MOU | Memorandum of Understanding |
| MPE | Maximum Predicted Environment |
| MRB | Material Review Board |
| MRD | Mission Requirement Document |
| MRR | Mission Readiness Review |
| MTS | Range Safety Metric Tracking System |
| MUCDR | Mission Unique Critical Design Review |
| MUPDR | Mission Unique Preliminary Design Review |
| MURR | Mission Unique Requirements Review |
| | |
| N/A | Not Applicable |
| NAFTA | North American Free Trade Agreement |
| NASA | National Aeronautics and Space Administration |
| NFS | NASA FAR Supplement |
| NLS | NASA Launch Services |
| NLT | No Later Than |
| NM | Nastran Model |
| NNC | NASA and NASA Customer(s) |
| No. | Number |
| NOAA | National Oceanic and Atmospheric Administration |
| NPD | NASA Policy Directive |
| NRO | National Reconnaissance Office |
| NSP | Not Separately Priced |
| NSS/GO | NASA Safety Standard/Ground Operations |
| NTE | Not To Exceed |
| | |
| OASPL | Over-All Sound Pressure Level |
| OFCCP | Office of Federal Contract Compliance Programs |
| OMB | Office of Management and Budget |

| | |
|----------|--|
| OR | Operational Requirements |
| P/FR | Problem/Failure Reporting |
| P/I | Payload Interface |
| P/L | Payload |
| P-Pod | Poly Picosatellite Orbital Deployer |
| PA | Payload Adapter |
| PCM | Pulse Code Modulation |
| PD | Policy Directive |
| PDR | Preliminary Design Review |
| PGAA | Performance and Guidance Accuracy Analysis |
| PHSF | Payload Handling and Storage Facility |
| PI | Program Introduction |
| PLF | Payload Fairing |
| PM | Project Manager |
| PMI | Program Management Instruction |
| POCC | Payload Operation Control Center |
| PP | Postponement |
| PPC | Procurement Placement Code |
| PPF | Payload Processing Facility |
| PR | Program Requirements Document |
| PRA | Probabilistic Risk Assessment |
| PRD | Program Requirements Data |
| psi | Pounds per Square Inch |
| Pub. L. | Public Law |
| QA | Quality Assurance |
| QMS | Quality Management System |
| Qty. | Quantity |
| QuikSCAT | Quick Scatterometer |
| RAB | Registrar Accreditation Board |
| rad. | Radian |
| RCS | Reaction Control System |
| Rec'd. | Received |
| Ref. | Reference |
| RF | Radio Frequency |
| RFO | Request For Order |

| | |
|--------|--|
| RFP | Request For Proposal |
| RFQ | Request For Quote |
| RHC | Right Hand Circular |
| RHU | Radioisotope Heater Unit |
| RLA | Right Ascension of Launch Asymptote |
| RMS | Reliability, Maintainability, and Supportability |
| RP | Reference Procedure |
| RP-1 | Rocket Propellant (Kerosene) |
| rpm | Revolutions Per Minute |
| RSA | Ride Share Adapter |
| RTD | Resistance Temperature Dectector |
| RTG | Radioisotope Thermal Generator |
| RTS | Reagan Test Site |
| | |
| S&MA | Safety and Mission Assurance |
| S/C | Space Craft |
| S/R | Shipping/Receiving |
| S/W | Software |
| SAD | Safe and Arm Device |
| SAEF | Spacecraft Assembly and Encapsulation Facility |
| SB | Small Business |
| SDB | Small Disadvantaged Business |
| SDL | Supplemental Data List |
| sec | Second |
| SE | Support Equipment |
| SF | Standard Form |
| SHAR | System Hazards Analysis Report |
| SIC | Standard Industrial Classification |
| SLC | Space Launch Complex |
| SLV | Space Launch Vehicle |
| SOW | Statement of Work |
| SpaceX | Space Exploration Technologies |
| SPASS | Secondary Payload Adaptor Separation System |
| SPL | Sound Pressure Level |
| SRM | Solid Rocket Motor |
| SRR | System Readiness Review |
| SSA | Source Selection Authority |
| ST | Space Technology |

| | |
|---------|--|
| STD | Standard |
| SW | Southwest |
| Sync | Synchronous |
| | |
| T | Time (as referenced from launch) |
| TBD | To Be Determined |
| TBP | To Be Proposed |
| TBR | To Be Reviewed or Resolved |
| TBS | To Be Specified |
| TDRSS | Tracking and Data Relay Satellite System |
| TE | Transporter/Erector |
| TEA-TEB | Redundant Hypergolic Igniters |
| TIC | Target Industry Categories |
| TIN | Taxpayer Identification Number |
| TM | Telemetry |
| TML | Total Mass Loss |
| Tot. | Total |
| TPA | Test Payload Adapter |
| TRD | Technical Requirements Document |
| TVC | Thrust Vector Control System |
| | |
| UDS | Universal Documentation System |
| UPN | Unique Project Number |
| USAKA | United States Army Kwajalein Atoll |
| U.S. | United States |
| U.S.C. | United States Code |
| UV | Ultraviolet |
| | |
| V | Volt |
| VAFB | Vandenberg Air Force Base |
| VDC | Voltage Direct Current |
| VETS | Veterans |
| Vert | Vertical |
| VP | Vice President |
| | |
| W | Watt |
| W | Week |
| WBS | Work Breakdown Structure |

| | |
|-----|------------------------------|
| WDR | W et Dress Rehearsal |
| WOB | W oman-Owned Business |
| WR | W estern Range (VAFB) |
| WTR | W estern Test Range |
| YY | Y ear |

